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ELECTRIC Suntree XinChi Electric

AC CONTACTOR SERIES

SHANGHAI XINCHI ELECTRIC CO.,LTD.

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ELECTRIC
Suntree
XinChi Electric

Innovative technology leads to better future.
professional working makes excellent quality.

Company Profile

ShangHai XinChi Electric Co., Ltd is a group company,There are four branch companies subordinate to it:YueQing Xinchi Electric Sci-Tech Co,Ltd, YueQing IMP and EXP Co., Ltd. HK Yangming Electrical Technology Co., Ltd. Wenzhou Litto smart Co., Ltd.

ShangHai XinChi Electric Co., Ltd. is one of the most professional manufacturers producing low-voltage and high-voltage electrical products, we mainly produce circuit breakers, contactors,and thermal overload relay. Fuse, Switch-disconnectors, ATS, Distribution box, SPD, SSR,Transformer, Relay, Button and signal lantern, Regulator, Switching power supply, and solar connector, DC circuit breaker, solar cable, DC Switch-disconnectors, and so on.

As an ISO9001:2008 certified company, we have obtained many certificates, Such as IEC60947, IEC60898, CB,SAA,TUV,CE, SONCAP, RoHS,Nemko,PCT,CCC etc.

Stability, expertise and technological innovation are the corner stones of the company's business strategy.

Aiming at reliable product quality and highest customers satisfaction, we are consistently deep-ening enterprise inner reform and fully carry out quality guarantee system. Such as the quality of all products is insured under PICC, fully guaranteed consumers, rights. With special cultivation of employees, high investment on production facilities and R&D, and wide range of products, we advocate technology innovation, business honesty and trust and always put quality as our basic principles, trying to develop into a world-class electrical manufacturer with constant efforts.

Technology Innovation, Famous in the world.

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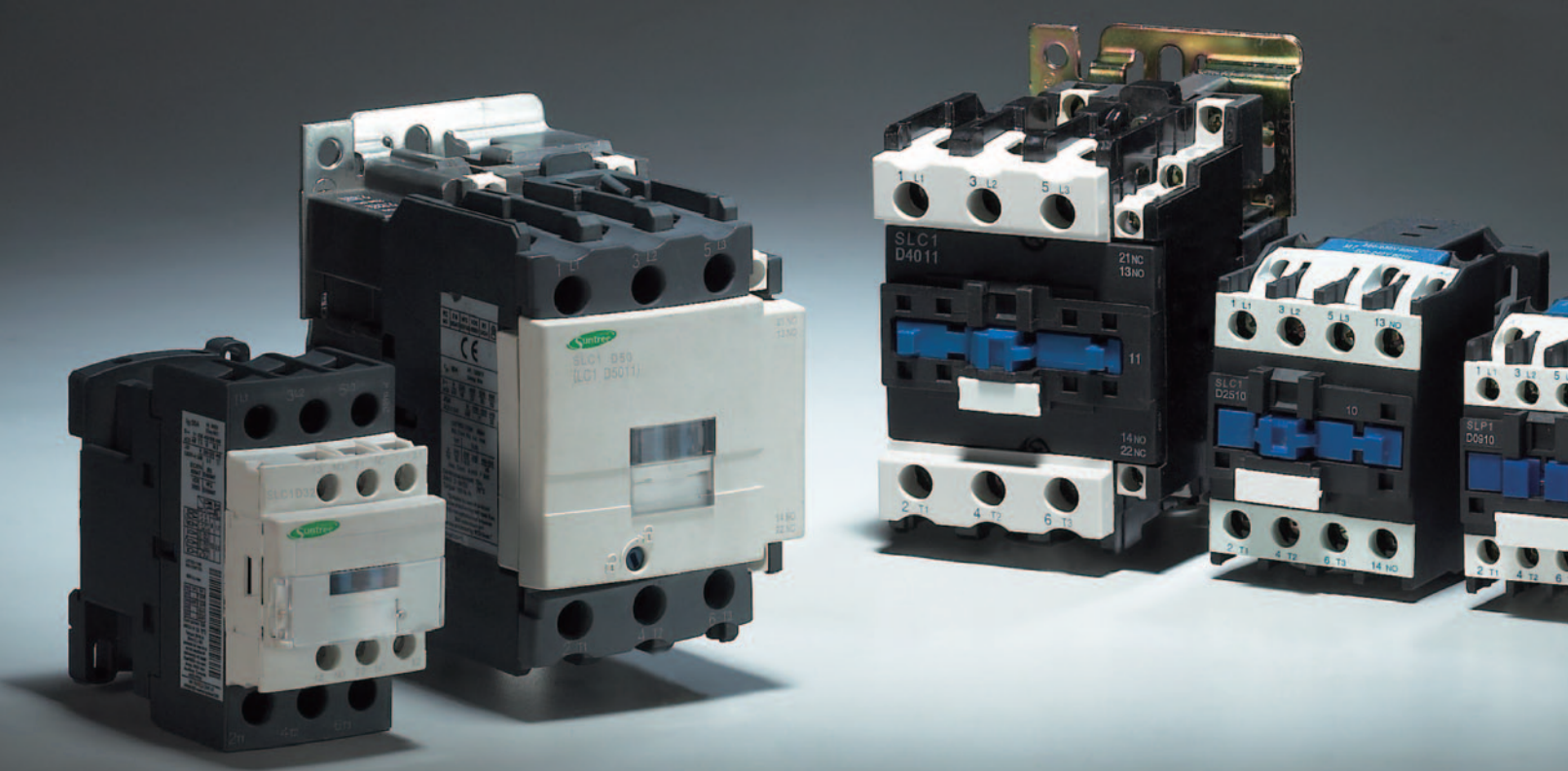
Suntree ELECTRIC
XinChi Electric

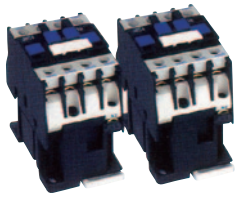
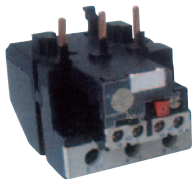
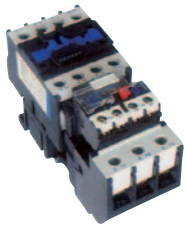
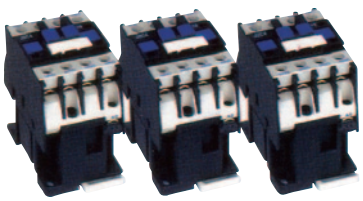
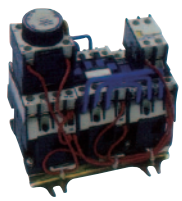
AC Contactor
Thermal Relay
Magnetic Starter

Convenient for use
Reasonable structure
Variety of fittings
Passing EMC test



AC Contactor

Characteristic

Contactor		Auxiliary Blocks		Relative products
	+	Delay timer	→	Time-delay contactor
	+	Mechanical interlock	→	Reversing contactor
	+	 Thermal relay	→	 Magnetic starter
	+	Current-limited auxiliary block	→	Changover capaciter contactor
	+	Delay timer + Auxiliary block	→	 Star-delta starter

SLC1-DN Series AC contactor

Production		SLC1-DN09	SLC1-DN18		SLC1-DN40		
Rated operational current	Ie max AC-3 (Ue ≤ 440V)	9A	12A	18A	25A	32A	38A
	Ie AC-1 (0 ≤ 60℃)	25A	25A	32A	40A	50A	50A
Rated operational voltage		690V					
Rated operational power in AC-3	220~240V	2.2kW	3kW	4kW	5.5kW	7.5kW	9kW
	380~400V	4kW	5.5kW	7.5kW	11kW	15kW	18.5kW
	415~440V	4kW	5.5kW	9kW	11kW	15kW	18.5kW
	500V	5.5kW	7.5kW	10kW	15kW	18.5kW	18.5kW
	660~690V	5.5kW	7.5kW	10kW	15kW	18.5kW	18.5kW
	1000V	-	-	-	-		
Auxiliary contacts		1 N/C and 1 N/O instantaneous incorporated in the contactors,with add-on blocks common to the whole					
Compatible manualauto thermal overload relays	Class 10A	0.10...10A	0.10...13A	0.10...18A	0.10...32A	0.10...38A	0.10...38A
	Class 20A	2.5...10A	2.5...13A	2.5...18A	2.5...32A		
Suppressor modules (d,c.and low consumption contactors have built-in suppression as standard)	Varistor	•	•	•	•	•	•
	Diode	-	-	•	-	-	•	-	-
	RC circuit	•	•	•	•	•	•	•	•
	Bidirectional peak limiting diode	•	•	•	•	•	•	•	•
Interfaces	Relay	•	•	•	•	•	•	•	•
	Relay+override function	•	•	•	•	•	•	•	•
	Solid state	•	•	•	•	•	•	•	•
Contactor type references	~or-3P	SLC1-DN09	SLC1-DN12	SLC1-DN18	SLC1-DN25	SLC1-DN32	SLC1-DN38
	~4-P	-	SLC1-DN12	-	SLC1-DN25	-	-
	-4P	-	SLC1-DN12	-	SLC1-DN25	-	-

SLC1-DN Series AC contactor

SLC1-DN40-65			SLC1--DN80-95	
40A	50A	65A	80A	95A
60A	70A	80A	110A	125A
1000V on supply, 690V on supply				
11kW	15kW	18.5kW	22kW	25kW
18.5kW	22kW	30kW	37kW	45kW
22kW	25/30kW	37kW	45kW	45kW
22kW	30kW	37kW	55kW	55kW
30kW	33kW	37kW	45kW	45kW
22kW	30kW	37kW	45kW	45kW
range comprising up to 4 N/C or N/O instantaneous,up to 1N/O+1N/C time delay and up to 2N/O or N/C protected contacts and 2 screen continuity terminals				
17...50A	17...70A	17...80A	17...104A	17...104A
17...40A	17...65A	17...70A	17...80A	
• •	•	• •	• •	•
• •	•	• •	• •	-
• •	•	• •	• •	•
• •	•	• •	• •	-
• •	•	• •	• •	•
• •	•	• •	• •	•
• •	•	• •	• •	•
SLC1-DN40	SLC1-DN50	SLC1-DN65	SLC1-DN80	SLC1-DN95
SLC1-DN40	-	SLC1-DN65	SLC1-DN80	-
SLC1-DN40	-	SLC1-DN65	SLC1-DN80	-

SLC1-D Series AC contactor

Application

SLC1-D series AC Contactor is suitable for using in the circuits up to the rated voltage 660V AC 50Hz or 60Hz, rated current up to 95A, for making, frequently stating & controlling the AC motor. Combined with the auxiliary contact block, timer delay & machine-interlocking device etc, it becomes the delay contactor, mechinical interlocking contactor, star-delta starter with the thermal relay, it is combined into the electromagnetic starter. The contactor is produced according to IEC947-2,VDE0660 & BS5452.

Specifications

Volts(VAC)	24	42	48	110	220/230	230	240	380/400	400	415	440	500	660
50Hz	B5	D5	E5	F5	M5	P5	U5	Q5	V5	N5	R5	S5	Y5
60Hz	B6	D6	E6	F6	M6	P6	U6	Q6	V6	N6	R6	S6	Y5
50/60Hz	B7	D7	E7	F7	M7	P7	U7	Q7	V7	N7	R7	S7	S7

Specifications

Type		SLC1-D09	SLC1-D12	SLC1-D18	SLC1-D25	SLC1-D32	SLC1-D40	SLC1-D50	SLC1-D65	SLC1-D80	SLC1-D95
Rated working current(A)	AC-3	9	12	18	25	32	40	50	65	80	95
	AC-4	3.5	5	7.7	8.5	12	18.5	24	28	37	44
AC3 capacity of phase 3 squirrel-cage motor AC3(kW)	220~230V	2.2	3	4	5.5	7.5	11	15	18.5	22	25
	380~400V	4	5.5	7.5	11	15	18.5	22	30	37	45
	415V	4	5.5	9	11	15	22	25	37	45	45
	440V	4	5.5	9	11	15	22	30	37	45	45
	500V	5.5	7.5	10	15	18.5	22	30	37	55	55
	660~690V	5.5	7.5	10	15	18.5	30	33	37	45	45
Rated heat current(A)		20	20	32	40	50	60	80	80	125	125
Electrical life	AC4 $\times 10^4$	10	10	10	10	8	8	6	6	6	6
	AC3 $\times 10^6$	1	1	1	1	0.8	0.8	0.8	0.6	0.6	0.6
Mechanical		20	20	20	20	20	20	20	20	10	10
Number of the contact		3P+NO 3P+NC					3P+NC+NO				

SLC1-F Series AC contactor

Application

SLC1-F series AC Contactor is applicable in the circuits up to the rated voltage 1000V AC 50Hz or 60Hz, rated current up to 780A, for long distance breaking circuit and frequently starting orcontrol the motor. it also can be used for the control of distribuition circuits of rated current from 200A to 1600A.

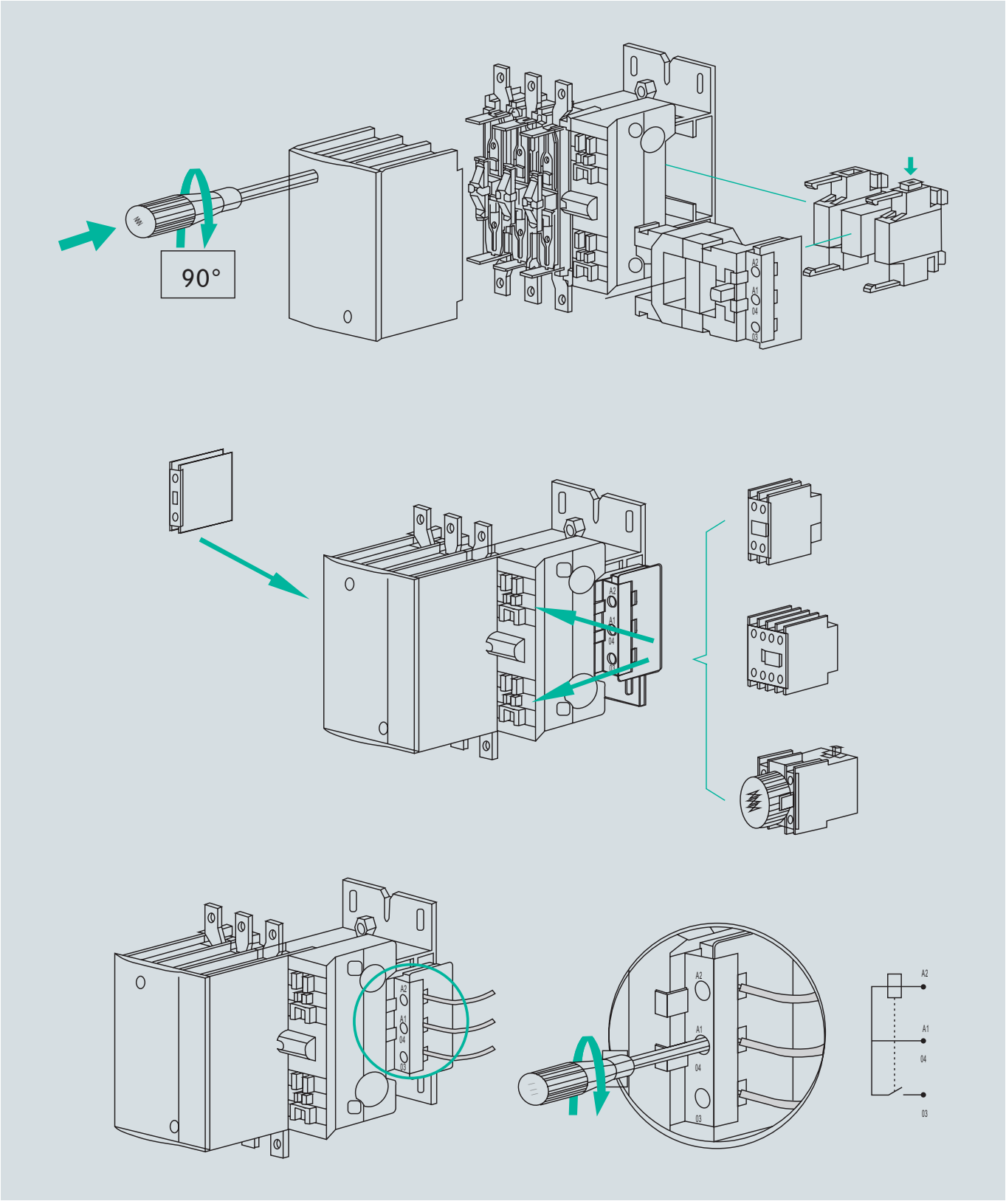
Specifications

Type		SLC1-F115	SLC1-F150	SLC1-F185	SLC1-F225	SLC1-F265
Rated working current(A)	AC-3	115	150	185	225	265
	AC-1	200	250	275	315	350
AC3 capacity of phase 3 squirrel-cage motor AC3(kW)	220~230V	30	40	55	63	75
	380~400V	55	75	90	110	132
	415V	59	80	100	110	140
	440V	59	80	100	110	140
	500V	75	90	110	129	160
	660~690V	80	100	110	129	160
	1000V	65	65	100	100	147

Type		SLC1-F330	SLC1-F400	SLC1-F500	SLC1-F630	SLC1-F780
Rated working current(A)	AC-3	330	400	500	630	780
	AC-1	400	500	700	1000	1600
AC3 capacity of phase 3 squirrel-cage motor AC3(kW)	220~230V	100	110	147	200	220
	380~400V	160	200	250	335	400
	415V	180	200	280	375	425
	440V	200	250	295	400	425
	500V	200	257	355	400	450
	660~690V	200	280	335	450	475
	1000V	160	185	335	450	450

SLC1-F Series AC contactor

Structure schematic diagram



SLC4-F Series 4 Pole AC contactor

Application

SLC4-F series AC Contactors thereafter referred to contactors are applied for electric power circuits of 50Hz or 60Hz, voltage up to 1000V and current up to 780A, they are for used for remotely making and breaking circuit and frequently actuating and controlling AC motors. They can be assembled with blocks such as auxiliary contact block, air time delay head and Y-stars. Also they can be directly plugged in by thermal relays and constructed as magnetic starters.

Specifications

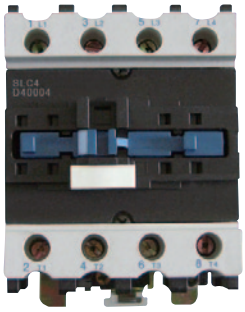
4 pole AC contactor；AC-1 200～1000A；AC-3 115～630A；AC/DC circuit

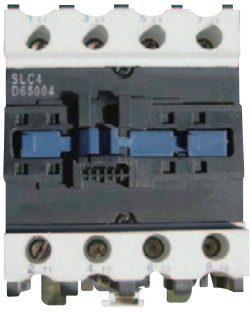
Model	NC.of Auxiliary contact	Rated work current	Appointed thermal current	Three phase motor rated power		Fuse(SCPD)		Weight
SLC4-F	NO	380V AC-3 Ie/A	AC-1 Ith/A	AC-3 380V 50Hz		Model	Rated current In/A	kg
				kW	HP-CH			
SLC4-F1154	4	115	200	55	75	RT16-2	250	4.3
SLC4-F1504	4	150	250	75	100	RT16-3	355	4.5
SLC4-F1854	4	185	275	90	125	RT16-2	425	5.4
SLC4-F2254	4	225	315	110	150	RT16-3	500	5.7
SLC4-F2654	4	265	350	132	180	RT16-3	630	8.5
SLC4-F3304	4	330	400	160	220	RT16-4	800	10
SLC4-F4004	4	400	500	200	280	RT16-4	800	10
SLC4-F5004	4	500	700	250	335	RT16-4	1000	12.9
SLC4-F6304	4	630	1000	335	450	RT16	1250	20.5

SLC4 Series 4-Pole contactor

Application

SLC4 series AC Contactor is suitable for using in the circuits up to the rated voltage 660V AC 50Hz or 60Hz, rated current up to 95A, for making, breaking, frequently starting & controlling the AC motor. Combined with the auxiliary contact block, timer delay & machine interlocking device etc, it becomes the delay contactor, machine interlocking contactor,star-delta starter. With the thermal relay, it is combined into the electromagnetic starter. The contactor is produced according to IEC947-2, VDE0660 & BS5452.





Control circuit: AC or DC, 4 Pole AC contactor

AC-3 AC-1 440V 0 ≤ 40℃ (A)		Rated nonconductive voltage		Power poles	Reference
		Control	circuit：a.	c.	~
9	25	690	4	-	SLC4-09004
			2	2	SLC4-09008
12	25	690	4	-	SLC4-12004
			2	2	SLC4-12008
25	40	690	4	-	SLC4-25004
			2	2	SLC4-25008
40	60	690	4	-	SLC4-40004
			2	2	SLC4-40008
50	80	690	4	-	SLC4-50004
			2	2	SLC4-50008
65	80	690	4	-	SLC4-65004
			2	2	SLC4-65008
80	125	690	4	-	SLC4-80004
			2	2	SLC4-80008
95	125	690	4	-	SLC4-95004
			2	2	SLC4-95008

Bobbin of AC contactor

SLX1-D2	Used for Contactor	SLC1-D09 to LC1-D18
SLX1-D4	Used for Contactor	SLC1-D25 to LC1-D32
SLX1-D6	Used for Contactor	SLC1-D40 to LC1-D95
SLX1-FF	Used for Contactor	SLC1-F115 to LC1-F150
SLX1-FG	Used for Contactor	SLC1-F185 to LC1-F225
SLX1-FH	Used for Contactor	SLC1-F265 to LC1-F330
SLX1-FJ	Used for Contactor	SLC1-F400
SLX1-FK	Used for Contactor	SLC1-F500
SLX1-FL	Used for Contactor	SLC1-F630
SLX1-FK(1)	Used for Contactor	SLC1-F780

SLP1-D Series DC operated AC contactor

Application

SLP1-D series DC operated AC contactor is suitable for use in the circuits up to the rated voltage 660V AC 50Hz or 60Hz, and in rated current 9-95A in AC-3/380V load circuits, for remote controlling circuit making,breaking and frequent starting AC motors. It can be also combined with the auxiliary contact group, air deplayer, thermal relay devices etc.
It has sepcialties of equable & reliable action, quick while working.

Specifications

Type	Power	Coil voltage				
SLP1-09Z~95Z	Direct	24	48	110	220	380
	Current	BD	ED	FD	MD	QD

Specifications

Type	Rated working current A(AC-3, 380V)	Controlled power					Number of the contacts
		220V	380V	415V	440V	660V	
SLP1-09Z	9	2.2	4	4	4	5.5	3P+NO or 3P+NC
SLP1-12Z	12	3	5.5	5.5	5.5	7.5	
SLP1-18Z	18	4	7.5	9	9	9	
SLP1-25Z	25	5.5	11	11	11	15	
SLP1-32Z	32	7.5	15	15	15	18.5	
SLP1-40Z	40	11	18.5	22	22	30	3P+NO+NC
SLP1-50Z	50	15	22	25	30	33	
SLP1-60Z	65	18.5	30	37	37	37	
SLP1-80Z	80	22	37	45	45	45	
SLP1-95Z	95	25	45	45	45	45	

SLC1-K Series AC contactor

Application

SLC1-K series AC contactor is suitable for use in the circuits up to the rated and frequent starting, controlling the AC motors. The addtion of auxiliary contact group to the contactor, combined with the proper thermal relay, can act to protect the circuit bound to overload.

Specifications

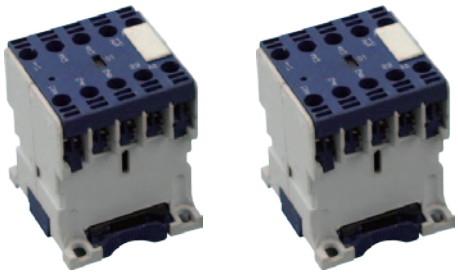
Type	Rated working current A(380V)	AC-3 use group control power (kW) 220V	380V~415V	440~500V	660V	Contact data(1)
SLC1-K06	6	1.5	2.2	3	3	3P+NO 3P+NC
SLC1-K09	9	2.2	4	4	4	3P+NO 3P+NC
SLC1-K12	12	3	3	5	5	3P+NO 3P+NC

Specifications			SLC1-K06	SLC1-K09	SLC1-K12
Use group under AC-3			6	9	12
Rated working current(Ie)A			5	7.5	10
Conventional thermal current(Ith)A			16	20	20
Rated working voltage(Ue)V			380 660		
Rated insullation voltage(Ui)V			690		
AC-3(6Ie Ie)	Electrical life(time)		0.5×10^6		
	Operation frequency h^{-1}		1200		
AC-3(6Ie Ie)	Electrical life(time)		10×10^4		
	Operation frequency h^{-1}		300		
Mecnical life			3×10^6		
Auxiliary contact	Conventional thermal current		6A		
	Electrical life(time)	AC-15(360VA)	0.5×10^6		
		DC-13(33W)			
Coil specifications	Rated control voltage(Us)		AC: 12, 24, 45, 110, 220, 380		
			DC: 12, 24, 45, 110, 220		
	Pick-up voltage		AC: 0.85~1.1Us DC: 0.85~1.1Us		
	Resleasing voltage		AC: 0.2~0.75Us DC: 0.2~0.75Us		
	Coil power VA	Pick-up	40		
		Fotain	4		
	Consumption		1.2W		
	Pick-up time		6~18ms		
	Releasing time		5~23ms		
	Power factor		Making 0.8 Breaking 0.3		

SLC1-E Series AC contactor

Application

SLC1-E series AC contactor is suitable for use in the circuit up to the rate and frequent starting, controlling the AC motor. The addition of auxiliary contact group to the contactor, combined with proper thermal relay, can act to protect the circuit bound to overload. It conforms to IEC60947-4-1.



Specifications

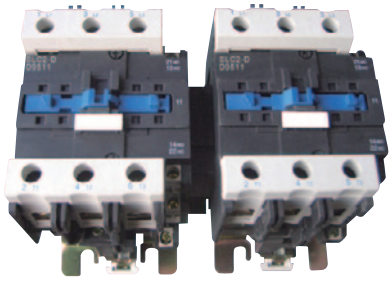
For motor control, from 6 to 630A(AC-3)；For the control of distribution circuits, from 16 to 1000A(AC-1)；Control circuit: d.c.

Standard power ratings of 3-phase motors 50~60Hz jin category AC-3 220V 380V 203V 400V 415V 440V 500V 690V						Rated oprerating current AC-3 AC-1 up to θ ≤ 40℃ 440V		Rated nonconductive voltage	Instantaceous auxiliary contacts		Basic reference complete with code indicating control circuit voltage(2) fixing(1)
kW	kW	kW	kW	kW	kW	A	A	V			
1.5	2.2	2.2	3	3	3	6	16	660	1	-	SLC1-EC6.3
									-	1	SLC1-EC09
2.2	4	4	4	4	4	9	16	660	1	-	SLC1-EC6.3
									-	1	SLC1-EC09

SLC2-D Mechanical interlocking contactor

Application

SLC2-D series machine interlock contactors are suitable for using in AC 50/60Hz and rating insulation voltage 690-1000V, rating voltage 380, rating current 9A-150A under AC-3, and control the positive and negative rotation of motor. Contactors conform with IEC60947-41, VED0660GB14048.4 and etc.



Specifications

Type	Rated current AC-3(A)	Controlled power(kW) 220V	380V	415V	440V	660V
SLC2-0910/01N	9	2.2	4	4	4	5.5
SLC2-1210/01N	12	5.5	5.5	5.5	5.5	7.5
SLC2-1810/01N	18	7.5	7.5	9	9	10
SLC2-2510/01N	25	5.5	11	11	11	15
SLC2-3210/01N	32	7.5	15	15	15	18.5
SLC2-4011N	40	18.5	18.5	22	22	30
SLC2-5011N	50	15	22	25	30	33
SLC2-6511N	65	18.5	30	37	37	37
SLC2-8011N	80	22	37	45	45	45
SLC2-9511N	95	22	45	45	45	41

SLC2-F Mechanical interlocking contactor

Features

1.Made up of by 2 same type AC contactors of SLC2-F interlocked by machine interlock.
2.Machine interlock doesn't affect the action time of ac contactor.
3.Products lops, assistant loop lead connected (the products not connected with lead supply).
4.Close frame and reliable interlock.

Specifications

Size:SLC2-F			115		1154		185		1854		265	
Maximum rated rated voltage			1000V		1000V		1000V		1000V		1000V	
Maximun thermal current lth			200A		200A		270A		270A		350A	
Maximum rated current LL: Long life/NL:Normal life 3PH....440V 50~60Hz			-	NL 120A	LL 115A	NL 150A	-	NL 185A	LL 185A	NL 205A	-	NL 265L
Maximum standard power rating under AC-3 duty	220V	kwhp	-	30 40	30 40	45 65	-	55 75	55 75	63 85	-	75 100
	380V	kwhp	-	55 75	55 75	75 100	-	90 125	90 125	110 150	-	132 180
	415/440V	kwhp	-	60 80	60 80	80 110	-	100 135	100 135	110 150	-	140 190

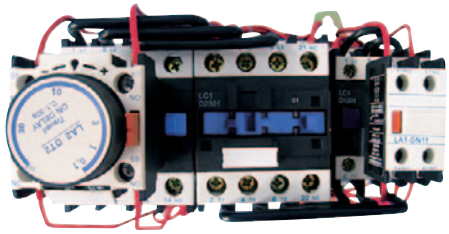
Specifications

Size:SLC2-F			2654		400		4004		500		630		780	
Maximum rated rated voltage			1000V		1000V		1000V		1000V		1000V		1000V	
Maximun thermal current lth			350A		500A		500A		700A		1000A		1600A	
Maximum rated current LL: Long life/NL:Normal life 3PH....440V 50~60Hz			NL 265L	NL 300A	-	NL 400A	LL 400A	NL 450A	LL 500A	NL 630A	LL 630A	NL 1000A	NL 800A	LL 780A
Maximum standard power rating under AC-3 duty	220V	kwhp	75 100	90 125	-	110 150	110 150	132 180	147 200	185 250	200 270	220 300	220 300	280 380
	380V	kwhp	132 180	160 220	-	200 270	200 270	220 300	250 340	335 450	335 450	400 540	400 540	500 680
	415/440V	kwhp	140 190	160 220	-	220 300	220 300	250 340	280 380	355 480	375 500	450 610	425 570	530 720

SLC3 Series star delta starter

Application

SLC3 is used as a motor starting device applied to the circuit current up to 95A 660V voltage AC 50/60Hz. It has timer which can be Deployed star delta conversion in order to reduce the the voltage and current of the motor starting.



Specification

Type	Rated operating current(A)	3-Phase motor capacity AC3 Loadde			
		220V	380V	415V	440V
SLC3-09	9	7	7.5	7.5	7.5
SLC3-12	12	5.5	11	11	11
SLC3-18	17	11	18.5	22	22
SLC3-25	25	11	22	22	22
SLC3-32	32	15	25	30	30
SLC3-40	40	18.5	37	37	37
SLC3-50	50	30	55	59	59
SLC3-65	65	32	55	59	59
SLC3-80	80	37	75	75	75
SLC3-95	95	45	80	80	80

Products group

AC380V 3-phase cage motor rating current IE power(kW)			Type	Withe star-daltareduced voltage starter and thermal relay	Set current range	With fuse
(kW)	A	A(0.58Ie)				
7.5	15.5	8.99	SLC3-09	SLR1-09	7-10	20
9	18.5	10.7	SLC3-12	SLR1-12	10-13	20
10	20	11.6	SLC3-12	SLR1-12	10-13	20
11	22	12.8	SLC3-18	SLR1-12	13-18	32
15	30	17.4	SLC3-25	SLR1-16	13-18	32
18.5	37	21.5	SLC3-32	SLR1-25	18-25	50
22	44	25.5	SLC3-32	SLR1-32	23-32	63
25	52	30.2	SLC3-63	SLR1-32	23-32	63
30	60	34.8	SLC3-63	SLR1-63	30-40	80
33	68	39.5	SLC3-63	SLR1-63	38-50	80
37	72	41.8	SLC3-63	SLR1-63	38-50	100
40	79	45.8	SLC3-63	SLR1-63	38-50	100
45	85	49.3	SLC3-63	SLR1-63	48-57	100
51	98	56.3	SLC3-63	SLR1-63	57-66	125
55	105	60.9	SLC3-63	SLR1-63	57-66	125
59	112	65	SLC3-80	SLR1-63	63-80	125
63	117	67.9	SLC3-80	SLR1-63	63-80	125
75	138	80	SLC3-95	SLR1-1051	75-105	160
80	147	85.3	SLC3-95	SLR1-1051	75-105	160

SLA1 Series contact blocks

Application

SLA1-DN series Auxiliary contact blocks are installed at the top of SLC1 AC contactors for expanding the couples of auxiliary contacts points. Owing to adopting the contacting functions of sliding frictions, the item can be Self-cleaning & ensure the electric circuit to be reliable.

Type and meaning

SLA1 - □ □

- Number of the NC contacts
- Number of the NC contacts
- Auxiliary contact group

Specification

Type contact number	SLA1-DN02	SLA1-DN11	SLA1-DN20	SLA1-DN22	SLA1-DN40	SLA1-DN04	SLA1-DN13	SLA1-DN31
	2NC	NO+NC	2NO	2NO+2NC	4NO	4NC	1NO+3NC	3NO+1NC

SLA2 Series contact blocks

Application

SLA2 timer delay auxiliary contact blocks are combined with SLC1 AC contactor & SLA1-DN Auxiliary contact block into star delta reduced voltage starter to start motor.

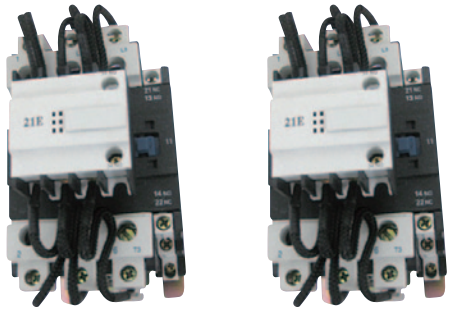
Specification

Type	Delay range	Delay type	Number of the delay contacts
SLA2-DT0	0.1-3s	OFF-DELAY	NO+NC
SLA2-DT2	0.1-30s	ON-DELAY	
SLA2-DT4	10-180s	OFF-DELAY	
SLA2-DR2	0.1-30s	OFF-DELAY	
SLA2-DR4	10-180s	OFF-DELAY	
SLA2-DR2	0.1-3s	OFF-DELAY	

SCJ19 Series switch-over capacitor contactor

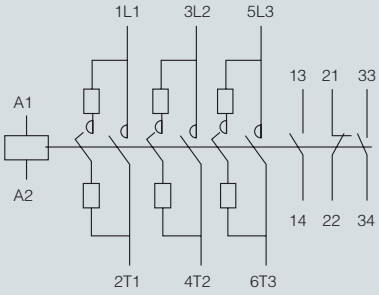
Application

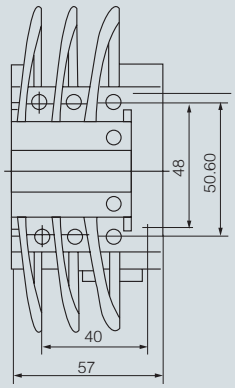
SCJ19 switch-over capacitor contactor is the new type of components for electric appliances, which is developed and produced on the basis of the same kind. The device is widely applied to the low voltage reactive power compensation screen to replace the subassembly composed of three XD1 current-limiting reactors and a SCJ10 contactor, and it is also can be used in the general control circuit to linit flashy flow.

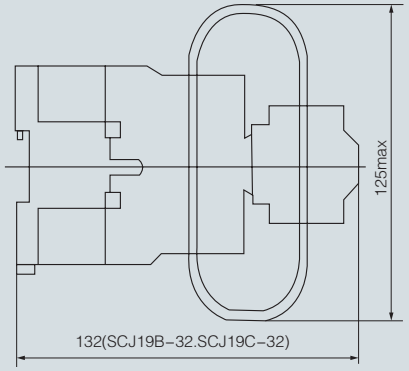


Main technic date / Overall dimension

Model			SCJ19-32	SCJ19-32	SCJ19B-32 SCJ19C-32	SCJ19B-32 SCJ19C-43	SCJ19B-63 SCJ19C-63	Contac-tor mode	Auxiliary contact	Quantity NO	Quantity NC	Mark	
400V Controlled 400V	Qn kvar output		18(16)	20	15	20	32	SCJ19-32/43	20E	2	-	13,14 23,24	-
	Rated voltage(A)		26(23)	29	21.6	29	46		02E	-	2	-	11,12 21,22
Working current 1.3 In A			33.8(30)	37.7	29	37.7	60		11E	1	1	13,14	21,22
Conventional heating current Ith A			32	43	37.7	43	69	SCJ19-63	21E	2	1	13,14 33,34	21,22
Controlling capability to flashy flow									12E	1	2	13,14	11,12 31,32
Coil	Working voltage Us 50Hz V		220, 380 or acording to user requirements										
	Working voltage Us 50Hz V		0.85~1.1Us										
	Consumed Power(VA)	Start holding	68 12		115 11		200 20						
Rated current for short-circuit protected fuse			1.3~2.5In										
Rated insulation voltage Ui 50Hz V			500				660						
Conventional heating current of auxiliary contacts AC 15A			10										
Mechanical life ten thousand times			100				80						
Electrical life operating frequency 120 1/h ten ten thousand times			10				8						
Weight kg			About 0.58		About 0.57	About 0.6	About 1.25						







S3TB Series AC contactor

Application

The contactor is suitable for using in the circuit up to the rated voltage 660V AC 50Hz or 60Hz, rated current 630A, for making and breaking, and for frequent starting and controlling the motor. After combined with the mechanical interlocking device, it becomes S3TD series convertible contactor for controlling, starting, breaking and reversing of the motor. The products comply with IEC947 & VDE0660.

Specification

Type	Rated thermal current(A)	Rated operating current at 380V(A)	Rated operating current at 660V(A)	The power of controlled motor(kW)		Type of auxiliary contact
				380(V)	660(V)	
S3TB40	22	9	7.2	4	5.5	1NO 1NC 1NO+1NC 2NO+2NC
S3TB41	22	12	9.5	5.5	7.5	
S3TB42	35	16	13.5	7.5	11	
S3TB43	35	22	13.5	11	11	
S3TB44	55	32	18	15	15	2NO+2NC

Specification

Type	Rated thermal current(A)	Rated operating current(A)		Controllable power of motor(kW)			
				AC-3		AC-4	
		380(V)	660(V)	380(V)	660(V)	380(V)	660(V)
S3TD40	20	9	7	4	5.5	1.4	2.4
S3TD41	20	12	8.5	5.5	7.5	1.9	3.3
S3TD42	30	16	12.5	7.5	11	3.5	6
S3TD43	30	22	16.5	10	15	4	6.6
S3TD44	55	32	24	15	22	7.5	13
S3TD45	55	38	24	18.5	22	9	15.5
S3TD46	80	45	40	22	37	12	20.8
S3TD47	80	63	60	30	55	14	24.3
S3TD48	100	75	60	37	55	17	29.5
S3TD49	100	85	80	45	75	21	36
S3TD50	160	110	95	55	90	27	46.9
S3TD51	160	140	120	75	110	35	60
S3TD52	200	170	160	90	150	38	66
S3TD53	210	205	165	110	160	50	86
S3TD54	300	250	230	132	220	58	100
S3TD55	300	300	260	160	250	68	114

S3TH Series auxiliary contactor

Application

The auxiliary contactors is the auxiliary suited by controlled circuit with voltage is AC 50Hz or 60Hz, 660V and DC 660V. They control all kinds of magnetic coil and amplify or transfer signal to relative controlled element simultaneously. They are characterized by high performance & long service life.

Specification

Rated voltage	Rated operational current(A)		Controllable motor power
	Ie=AC11 AC14	DC11	
110V	-	0.9	-
220V	10	0.45	2.2
380V	6	-	4
440V	-	0.25	4
660V	2	-	4

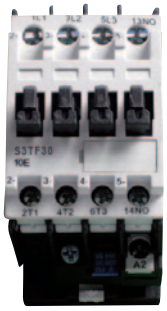
Type	Type of contact	
	NO	NC
S3TH30	4	-
31-OA	3	1
22-OA	2	2
13-OA	1	3
04-OA	-	4
S3TH40/3TH80 40-OA	4	-
31-OA	3	1
22-OA	2	2
13-OA	1	3
04-OA	-	4
S3TH42/3TH82 80-OA	8	-
71-OA	7	1
62-OA	5	2
53-OA	5	3
44-OA	4	4

S3TF Series AC contactor

Application

S3TF series AC contactor are suitable in electrical system with AC 50Hz or 60Hz, rated operational voltage up to 660V. In AC-3 usage, rated operational voltage up to 380V, rated operational current up to 630A to make or break remote motors or system. They from electromagnetic starters with suitable thermal overload or phase-failure. They are made according to IEC947, BS5424 & VDE0660.

The contactor is a straight motion mechanism having double-breaking contacts. The auxiliary contacts are arranged 2NO.2NC at most, it is employed the flexible locking connection between the contact support and core , three are no arcisolated panle in the Ie ≤ 22A contactors, in the Ie ≤ 32A contactors, there are moulded are-chute with arc-isolated panel. Because all contacts are made of high nonfusibility and against corrosion silver alloy. All series products can be mounted by screws, Ie ≤ 32A contactor also by installation rail.



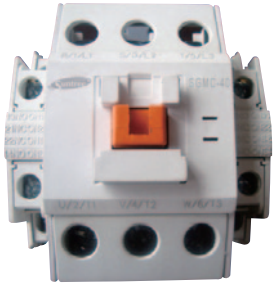
Specification

Type	Rated thermal current(A)	Rated operating current(A)		Controllable power of motor(kW) AC-3		AC-4		Type of auxiliary contact
		380(V)	660(V)	380(V)	660(V)	380(V)	660(V)	
S3TF30	20	9	7	4	5.5	1.4	2.4	NO NC 1NO+1NC 2NO+2NC
S3TF31	20	12	8.5	5.5	7.5	1.9	3.3	
S3TF32	30	16	12.5	7.5	11	3.5	6	
S3TF33	30	22	16.5	10	15	4	6.6	
S3TF34	55	32	24	15	22	7.5	13	
S3TF35	55	38	30	18.5	22	9	15.5	
S3TF40	20	9	7	4	5.5	1.4	2.4	
S3TF41	20	12	8.5	5.5	7.5	1.9	3.3	
S3TF42	30	16	12.5	7.5	11	3.5	6	
S3TF43	30	22	16.5	10	15	4	6.6	
S3TF44	55	32	24	15	22	7.5	13	
S3TF45	55	38	30	18.5	22	9	15.5	
S3TF46	80	45	40	22	37	12	20.8	2NO+2NC 4NO+4NC
S3TF47	80	63	60	30	55	14	24.3	
S3TF48	100	75	60	37	55	17	29.5	
S3TF49	100	85	80	45	75	21	36	
S3TF50	160	110	95	55	90	27	46.9	
S3TF51	160	140	120	75	110	35	60	
S3TF52	200	170	160	90	150	38	66	
S3TF53	210	205	165	110	160	50	86	
S3TF54	300	250	230	132	220	58	100	
S3TF55	300	300	260	160	250	66	114	
S3TF56	400	400	380	200	355	81	140	
S3TF68	630	630	600	335	560	160	278	

SGMC Contactors

Application

SGMC series AC contactors, The series of products for frequency of 50/60Hz, rated insulation voltage up to 690-1000V, raged operational current up to 9A -400A at rated operational making breaking electric circuits at a long distance and for frequent starting stopping and reversing control of AC motors. They products comply with IEC947 & VDE0660.



3-pole contactors

Frame size		9A		12A		18A		22A	
Types	AC coil	SGMC-9		SGMC-12		SGMC-18		SGMC-22	
Ratings/IEC60947-4		kW	A	kW	A	kW	A	kW	A
AC1			25		25		40		40
AC3	200/240V	2.5	11	3.5	13	4.5	18	5.5	22
	380/440V	4	9	5.5	12	7.5	18	11	22
	500/550V	4	7	7.5	12	7.5	13	15	22
	690V	4	5	7.5	9	7.5	9	15	18
Ratings/UL508		hp	A	hp	A	hp	A	hp	A
Continuous current			20		25		30		32
Single phase	115V	0.5		0.5		1		2	
	230V	1		2		3		3	
Three phase	200V	2		3		5		7	
	230V	2		3		5		7.5	
	460V	5		7.5		10		10	
	575V	7.5		10		15		15	
NEMA size		00		00		0		0	

4-pole contactors

Types	AC coil	SGMC-9/4	SGMC-12/4	SGMC-18/4	SGMC-22/4
AC1(A)		20	20	25	32
Available coil voltages		AC:24,42,48,110,120,208,220,240,277,380,440,480,600V DC:12,20,24,48,60,80,100,110,125,200,220,250V Ordering Example:GMC-9-AC120V			

	Configuration	Part No	Configuration	Part No	Configuration	Part No
Additional Auxiliary Contacts	2 N.O	AU-2-20	4 N.O.	AU-4-40	1 N.O./1 N.O.	AU-1
	2 N.C	AU-2-02	3 N.O./1 N.C.	AU-4-31		
	1 N .O./1 N. C.	AU-2-11	2 N.O./2 N.C.	AU-4-22		
			1 N.O./3 N.C.	AU-4-13		
			4 N.C.	AU-4-04		

SGMC Contactors

3-pole contactors

Frame size		32A		40A		50A		60A		75A		85A	
Types	AC coil	SGMC-32		SGMC-40		SGMC-50		SGMC-65		SGMC-75		SGMC-85	
Ratings/IEC60947-4		kW	A	kW	A	kW	A	kW	A	kW	A	kW	A
AC1			50		60		80		100		110		135
AC3	200/240V	7.5	32	11	40	15	55	18.5	65	22	75	25	85
	380/440V	15	32	18.5	40	22	50	30	65	37	75	45	85
	500/550V	18.5	28	22	32	30	43	33	60	37	64	45	75
	690V	18.5	20	22	23	30	28	33	35	37	42	45	45
Ratings/UL508		hp	A	hp	A	hp	A	hp	A	hp	A	hp	A
Continuous current			45		50		70		80		90		100
Single phase	115V	2		3		3		5		5		7.5	
	230V	5		5		7.5		10		15		15	
Three phase	200V	7.5		10		10		15		20		25	
	230V	10		10		15		20		25		30	
	460V	20		25		30		40		50		50	
	575V	20		25		30		40		50		50	
NEMA size		1		1		2		2		2		3	

4-pole contactors

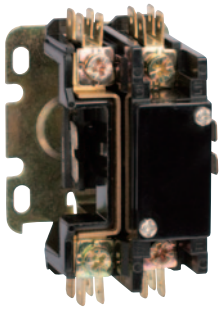
Types	AC coil	SGMC-32/4	SGMC-40/4	SGMC-50/4	SGMC-65/4	SGMC-75/4	SGMC-85/4
AC1(A)		50	60	80	100	110	135
Available coil voltages		AC:24,42,48,110,120,208,220,240,277,380,440,480,600V DC:12,20,24,48,60,80,100,110,125,200,220,250V Ordering Example:GMC-9-AC120V					

	Configuration	Part No	Configuration	Part No	Configuration	Part No
Additional Auxiliary Contacts	2 N.O	AU-2-20	4 N.O.	AU-4-40	1 N.O./1 N.O.	AU-1
	2 N.C	AU-2-02	3 N.O./1 N.C.	AU-4-31		
	1 N .O./1 N. C.	AU-2-11	2 N.O./2 N.C.	AU-4-22		
			1 N.O./3 N.C.	AU-4-13		
			4 N.C.	AU-4-04		

SUN1 Series AC contactor

Application

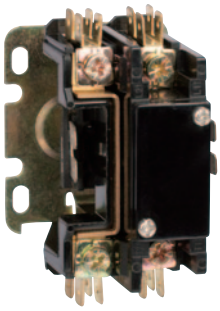
SUN1 series definite purpose AC contactor are designed for use in refrigeration, air conditioning, and electric heating systems. Power connections can be made with either screw terminals with quick onnects or lug terminals with quick connec ts. Standard According：GB14048.4, UL508, IEC60947-4.

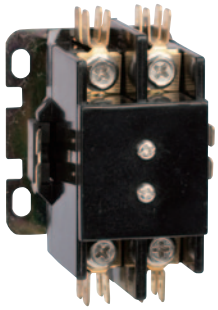


Specification

Type	No. of Poles	Rated Current(A)	Coil Voltage 50/60Hz(V)	Approval	Case Qty.(Pcs)	Item code
SUN1-20/1 24V	1P	20	24	-	40	43201024
SUN1-20/1 120V	1P	20	120	-	40	43201120
SUN1-20/1 240V	1P	20	240	-	40	43201240
SUN1-25/1 24V	1P	25	24	-	40	43251024
SUN1-25/1 120V	1P	25	120	-	40	43251120
SUN1-25/1 240V	1P	25	240	-	40	43251240
SUN1-30/1 24V	1P	30	24	cULus	40	43301024
SUN1-30/1 120V	1P	30	120	cULus	40	43301120
SUN1-30/1 240V	1P	30	240	cULus	40	43301240
SUN1-20/2 24V(2P)	2P	20	24	cULus	40	43202024
SUN1-20/2 120V(2P)	2P	20	120	cULus	40	43202120
SUN1-20/2 240V(2P)	2P	20	240	-	40	43202240
SUN1-25/2 24V(2P)	2P	25	24	-	40	43252024
SUN1-25/2 120V(2P)	2P	25	120	cULus	40	43252120
SUN1-25/2 240V(2P)	2P	25	240	cULus	40	43252240
SUN1-30/2 24V(2P)	2P	30	24	cULus	40	43302024
SUN1-30/2 120V(2P)	2P	30	120	cULus	40	43302120
SUN1-30/2 240V(2P)	2P	30	240	cULus	40	43302240
SUN1-40/2 24V(2P)	2P	40	24	cULus	40	43402024
SUN1-40/2 120V(2P)	2P	40	120	cULus	40	43402120
SUN1-40/2 240V(2P)	2P	40	240	cULus	40	43402240
SUN1-20/2 24V(2PC)	2P	20	24	cULus	40	43206024
SUN1-20/2 120V(2PC)	2P	20	120	cULus	40	43206120

SUN1 Series AC contactor





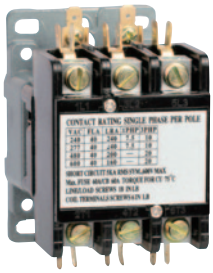
Specification

Type	No. of Poles	Rated Current(A)	Coil Voltage 50/60Hz(V)	Approval	Case Qty.(Pcs)	Item code
SUN1-20/2 240V(2PC)	2P	20	240	-	40	43206240
SUN1-25/2 24V(2PC)	2P	25	24	-	40	43256024
SUN1-25/2 120V(2PC)	2P	25	120	cULus	40	43256120
SUN1-25/2 240V(2PC)	2P	25	240	cULus	40	43256240
SUN1-30/2 24V(2PC)	2P	30	24	cULus	40	43306024
SUN1-30/2 120V(2PC)	2P	30	120	cULus	40	43306120
SUN1-30/2 240V(2PC)	2P	30	240	cULus	40	43306240
SUN1-40/2 24V(2PC)	2P	40	24	cULus	40	43406024
SUN1-40/2 120V(2PC)	2P	40	120	cULus	40	43406120
SUN1-40/2 240V(2PC	2P	40	240	cULus	40	43406240
SUN1-20/2 24V(2PCS)	2P	20	24	cULus	40	43209024
SUN1-20/2 120V(2PCD)	2P	20	120	cULus	40	43209120
SUN1-20/2 240V(2PCS)	2P	20	240	-	40	43209240
SUN1-25/2 24V(2PCS)	2P	25	24	-	40	43259024
SUN1-25/2 120V(2PCS)	2P	25	120	cULus	40	43259120
SUN1-25/2 240V(2PCS)	2P	25	240	cULus	40	43259240
SUN1-30/2 24V(2PCS)	2P	30	24	cULus	40	43309024
SUN1-30/2 120V(2PCS)	2P	30	120	cULus	40	43309120
SUN1-30/2 240V(2PCS)	2P	30	240	cULus	40	43309240
SUN1-40/2 24V(2PCS)	2P	40	24	cULus	40	43409024
SUN1-40/2 120V(2PCS)	2P	40	120	cULus	40	43409120
SUN1-40/2 240V(2PCS)	2P	40	240	cULus	40	43409240

SUN1 Series AC contactor

Application

1. Air Conditioning
2. Heating
3. Ventilating
4. Refrigeration
5. Food and Beverage Industries
6. Hoist and Cranes
7. Elevators
8. Lighting
9. Pool and Spa
10. Welding
11. Pump and Compressor
12. Conveyors



Specification

Type	No. of Poles	Rated Current(A)	Coil Voltage 50/60Hz(V)	Approval	Case Qty.(Pcs)	Item code
SUN1-25/3 24V (3PA)	3P	25	24	cULus	32	43253024
SUN1-25/3 120V (3PA)	3P	25	120	cULus	32	43253120
SUN1-25/3 240V (3PA)	3P	25	240	cULus	32	43253240
SUN1-30/3 24V (3PA)	3P	30	24	cULus	32	43303024
SUN1-30/3 120V (3PA)	3P	30	120	cULus	32	43303120
SUN1-30/3 240V (3PA)	3P	30	240	cULus	32	43303240
SUN1-40/3 24V (3PA)	3P	40	24	cULus	32	43403024
SUN1-40/3 120V (3PA)	3P	40	120	cULus	32	43403120
SUN1-40/3 240V (3PA)	3P	40	240	cULus	32	43403240
SUN1-50/3 24V (3PA)	3P	50	24	cULus	32	43503024
SUN1-50/3 120V (3PA)	3P	50	120	cULus	32	43503120
SUN1-50/3 240V (3PA)	3P	50	240	cULus	32	43503240
SUN1-60/3 24V (3PA)	3P	60	24	cULus	32	43603024
SUN1-60/3 120V (3PA)	3P	60	120	cULus	32	43603120
SUN1-60/3 240V (3PA)	3P	60	240	cULus	32	43603240
SUN1-75/3 24V (3PA)	3P	75	24	cULus	32	43753024
SUN1-75/3 120V (3PA)	3P	75	120	cULus	32	43753120
SUN1-75/3 240V (3PA)	3P	75	240	cULus	32	43753240
SUN1-25/3 24V (3PB)	3P	25	24	cULus	32	43258024
SUN1-25/3 120V (3PB)	3P	25	120	cULus	32	43258120
SUN1-25/3 240V (3PB)	3P	25	240	cULus	32	43258240
SUN1-30/3 24V (3PB)	3P	30	24	cULus	32	43308024
SUN1-30/3 120V (3PB)	3P	30	120	cULus	32	43308120
SUN1-30/3 240V (3PB)	3P	30	240	cULus	32	43308240
SUN1-40/3 24V (3PB)	3P	40	24	cULus	32	43408024
SUN1-40/3 120V (3PB)	3P	40	120	cULus	32	43408120
SUN1-40/3 240V (3PB)	3P	40	240	cULus	32	43408240

SUN1 Series AC contactor

Specification

Type	No. of Poles	Rated Current(A)	Coil Voltage 50/60Hz(V)	Approval	Case Qty.(Pcs)	Item code
SUN1-25/3 24V (3P)	3P	25	24	cULus	32	43257024
SUN1-25/3 120V (3P)	3P	25	120	cULus	32	43257120
SUN1-25/3 240V (3P)	3P	25	240	cULus	32	43257240
SUN1-30/3 24V (3P)	3P	30	24	cULus	32	43307024
SUN1-30/3 120V (3P)	3P	30	120	cULus	32	43307120
SUN1-30/3 240V (3P)	3P	30	240	cULus	32	43307240
SUN1-40/3 24V (3P)	3P	40	24	cULus	32	43407024
SUN1-40/3 120V (3P)	3P	40	120	cULus	32	43407120
SUN1-40/3 240V (3P)	3P	40	240	cULus	32	43407240
SUN1-25/3 24V (3P)	3P	25	24	cULus	32	43255024
SUN1-25/3 120V (3P)	3P	25	120	cULus	32	43255120
SUN1-25/3 240V (3P)	3P	25	240	cULus	32	43255240
SUN1-30/3 24V (3P)	3P	30	24	cULus	32	43305024
SUN1-30/3 120V (3P)	3P	30	120	cULus	32	43305120
SUN1-30/3 240V (3P)	3P	30	240	cULus	32	43305240
SUN1-40/3 24V (3P)	3P	40	24	cULus	32	43405024
SUN1-40/3 120V (3P)	3P	40	120	cULus	32	43405120
SUN1-40/3 240V (3P)	3P	40	240	cULus	32	43405240

SUN1 Series AC contactor

Application

Reversing hoist contactors are designed for the control of motors in hoists, overhead doors, small elevators, commercial laundry equipment, and other related products which use revering motors. They are rated to perform in the short periods of jogging experienced in hoist service. They are suitable for other non cycling duty application requiring reliable low cost switching. Standard required: GB14048.4, UL508, IEC60947-4.

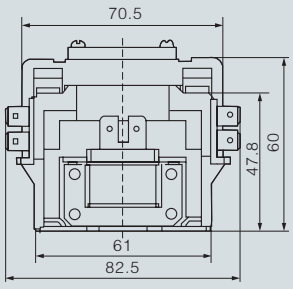
Specification

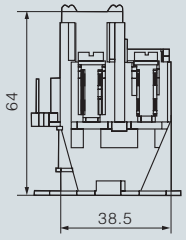
Type	No. of Poles	Rated Current(A)	Coil Voltage 50/60Hz(V)	Case Qty.(Pcs)	Item code
SUN1-25/4 24V (4PS)	4P	25	24	32	43254024
SUN1-25/4 120V (4PS)	4P	25	120	32	43254120
SUN1-25/4 240V (4PS)	4P	25	240	32	43254240
SUN1-30/4 24V (4PS)	4P	30	24	32	43304024
SUN1-30/4 120V (4PS)	4P	30	120	32	43304120
SUN1-30/4 240V (4PS)	4P	30	240	32	43304240
SUN1-40/4 24W (4PS)	4P	40	24	32	43404024
SUN1-40/4 120V (4PS)	4P	40	120	32	43404120
SUN1-40/4 240V (4PS)	4P	40	240	32	43404240
SUN1-25/4 24V	4P	25	24	16	43250024
SUN1-25/4 120V	4P	25	120	16	43250120
SUN1-25/4 240V	4P	25	240	16	43250240
SUN1-30/4 24V	4P	30	24	16	43300024
SUN1-30/4 120V	4P	30	120	16	43300120
SUN1-30/4 240V	4P	30	240	16	43300240
SUN1-40/4 24W	4P	40	24	16	43400024
SUN1-40/4 120V	4P	40	120	16	43400120
SUN1-40/4 240V	4P	40	240	16	43400240

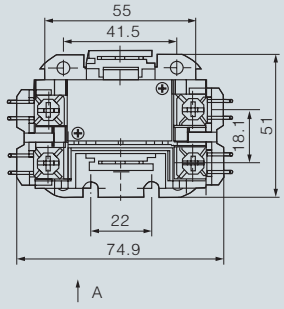
SUN1 Series AC contactor

Dimensions

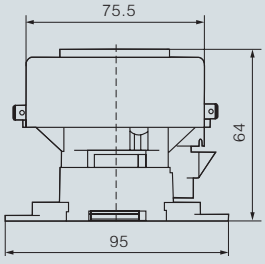
1P

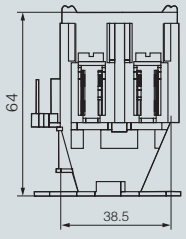


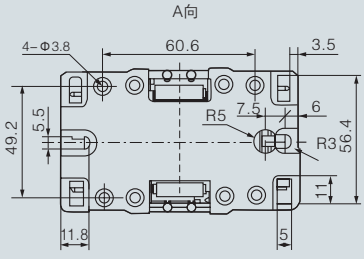




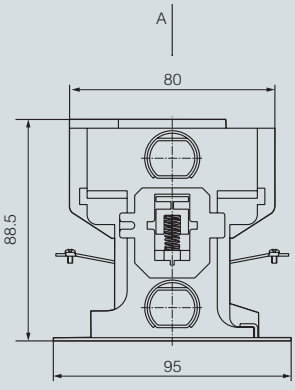
2P

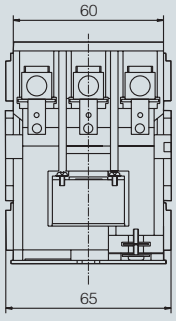


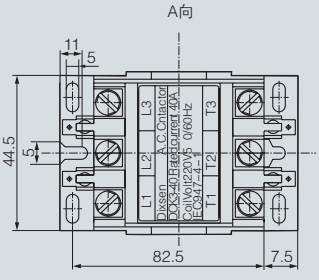




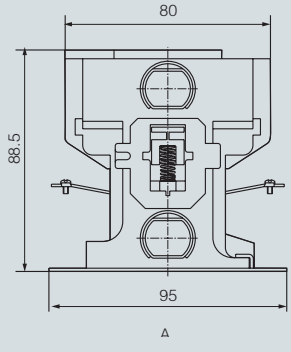
3PS

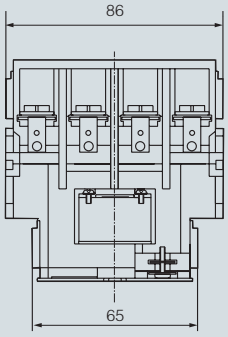


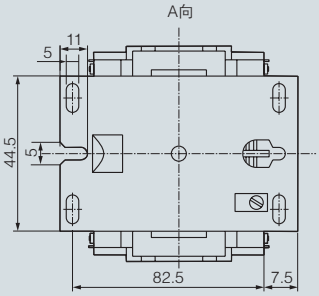




4PS







SA Series AC contactor

Application

SA-9～300 AC contactor(hereafter refer to as contactor)is mainly used in power system with
AC 50/60Hz, therated working voltage up to 660V, under the application category of AC-3, when the rated working voltage 380V, the rated operating current to 300A electrical, for thelong-distance range making and breaking the electric circuit, and combines the electorm agnetismstarter with the suitable thermal overload relay or the electronic protector to protect against thepossible overload electric circuit during operation(running).

Main structure and working principle

1. The structure of the contactor is the positive mounted straight action type double-break dots,cover and the body are made by the arc proof plastic, SA-9～16 uses the auto extinguishing ofarc, but SA-26～110 has" U" shape the extinguishing of arc piece in the body to form the seal explosion chamber. The extinguishing of arc is good, the arc over distance is zero. The contact is made by the anti-fusion welding and bears the silver base alloy material wear electricity with good electric conductivity, long life, does not have the pollution to the environment. The ferrite core has" E" shape structure, small vloume. There are two kinds of coil wiring ways for the user choice, one is the two terminals in the identical end of the product; other is the two terminals in the products beginnings and ends, the wiring is flexible and convenient. The base is made by the glass fiber reinforced plastice with high intensity, good dielectric properties. The installation way can be the bolt, also may use the guide rail installment. The idsassemble and assemble are very convenient and rapid. The electric conduction part does not appear externally, the security performance is good.
2. The working principle of contactor: control power source power source of making(breaking) contactor pullin coil, magnetism system produces(vanishes)electromagnetism suction to drive the moving part making and(breaking) circuit through then, realize the goal of control.

Technical parameter

The allowable application category of main circuit and the auxiliary circuit of the contactorand it’s code see Table 1.
Table 1 application category of main circuit and the auxiliary circuit of the contactor and it’s code.

Circuit	Application category code	Example of the typical usage
Main circuit	SA-1	Noninductive or the micro ineuductive load, resistance furnace
	SA-2	The starting and breaking of wire winding type asynchronous motor
	SA-3	The starting and breaking during operation of cage asynchronous motor
	SA-4	The starting, plug breaking or reverse revolution, spot moving of cageasynchronous motor
Auxiliary circuit	SA-15	Control AC electromagnet load(>72VA)
	SA-13	Control DC magnet load

SA Series AC contactor

Common work condition and installing condition

a. The installation site elevation does not surpass 2000m;
b. Ambient air temperature should not over +40℃ , also not over +35℃ with in 24h, the lower limit of ambient air temperature is -5℃ ;
c. The air relative humidity at installation site should not over 50% when the maximum temperature is +40℃ ; the higher relative humidity are allowed under lower temperature, for example, 90% at 20 ℃ , It must take the mesures on the product occuring dew because of the change oftemperature.
d. The installation site pollution class is 3;
e. The contactor can be mounted vertically or horizontally. If vertically mounts, the gradient between the mounted surface and the perpendicular plans is not bigger than=30%; (SeeFig1)

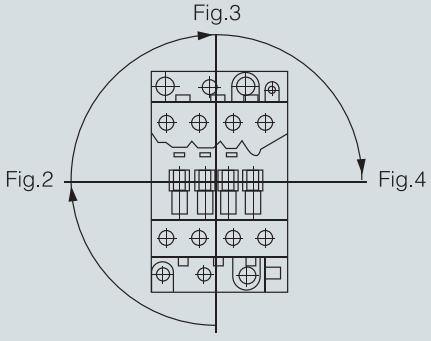


Fig.1

1)The installation site pollution class is 3

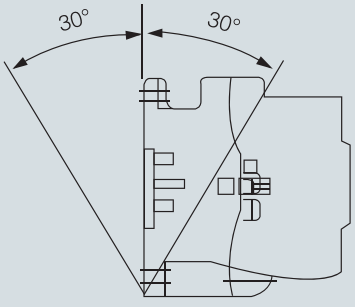


Fig.1 ± 30°

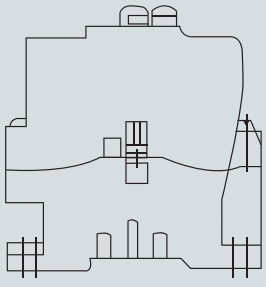


Fig.5

SA Series AC contactor

Working conditions

Contactor rated insulation voltage(Ui), reted working voltage(Ue), conventional free air heatcurrent(Ith), rated operating current(Ie) and rated work rate see Table 2.

Table 2 main circuits basic parameters.

Type	Frame code	Rated insulation voltage(Ui) V	Convensional free air heat current Ith	AC-3 rated operating current(Ie) A			AC-3 control the max.power kW of generator		
				220V	380V	660V	220V	380V	660V
SA-9	16	1000	26	9	9	7	2.2	4	5.5
SA-12			28	12	12	9	3	5.5	6.5
SA-16			30	17	17	10	4	7.5	9
SA-26	26		45	26	26	17	6.5	11	15
SA-30	40		65	32	32	21	9	15	18.5
SA-40			65	37	37	25	11	8.5	22
SA-50	75		100	50	50	35	15	22	30
SA-63			125	65	65	43	18.5	30	37
SA-75			125	75	75	46	22	37	40
SA-95	110		145	96	96	65	25	45	55
SA-110			160	110	110	82	30	55	75
SA-145	185		250	145	145	120	40	75	100
SA-185			275	185	185	170	50	90	120
SA-210	300		350	210	210	210	60	110	150
SA-260			400	260	260	260	78	140	190
SA-300			450	300	300	280	88	160	220

Installation

Correct install wiring

Note that the terminal symbole: Main circuit 1L1,3L2,5L3 is incoming therminal; 2T1,4T2,6T3 outgoing terminal.

The incoming terminal of NO auxiliary contact is: 13,23,33,43the outgoing terminal of NO auxiliary contact is: 14,24,34,44The outgoing terminal of OFF auxiliary contat is :11,21,31,41the outgoing terminal of OFF auxiliary contact is: 12,22,32,42The coil terminal is: A1and A2.

Contactors Overall and installation dimensions see Figure 2, Figure 4, Figure 5 and table 9.

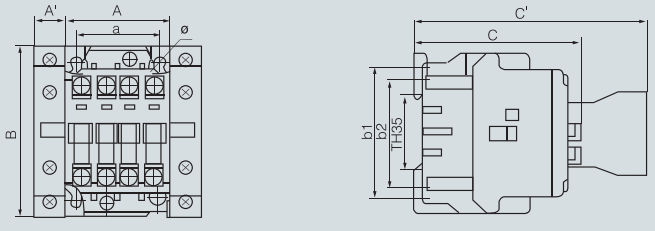


figure2：SA–9、12、16dimensions and installation size

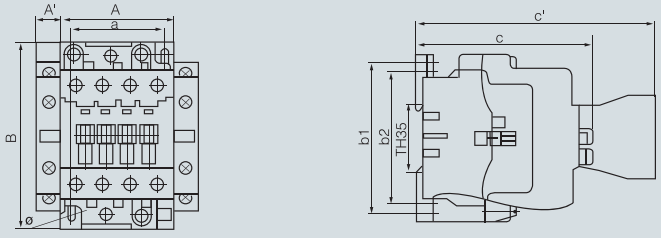


figure3：SA–26、30、40 dimensions and installation size

SA Series AC contactor

Type	A	A'	B	C	C° Φ	a	b1	b2	Φ	ounting mode
SA-9,12,16	44	12.5	74	74	102	35	60	50	4.5	Screw installation or TH75 mounting rail installation
SA-26	54	12.5	90	93.5	120.5	45	80	70	4.2	
SA-30,40	54	12.5	90	108.5	135.2	45	80	70	4.2	
SA-50,63,75	70	12.5	110	108	135	60	100	90	6.2	installation or TH35 or TH75 mounting rail installtion
SA-95,110	90	12.5	148.5	123.5	151	78	136	126	6.2	Screw installation or TH75 mounting rail installation

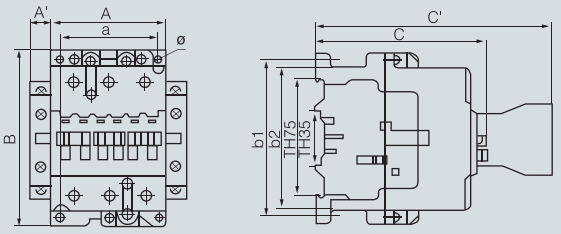


figure4：SA-50、63、75 dimensions and installation size

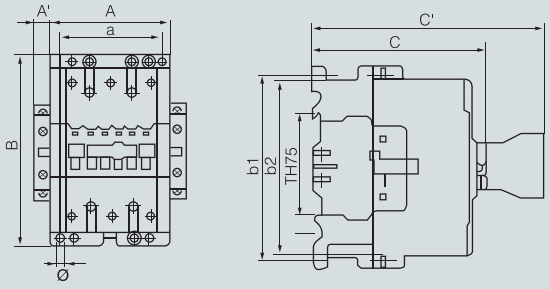


figure5：SA-95、110 dimensions and installation size

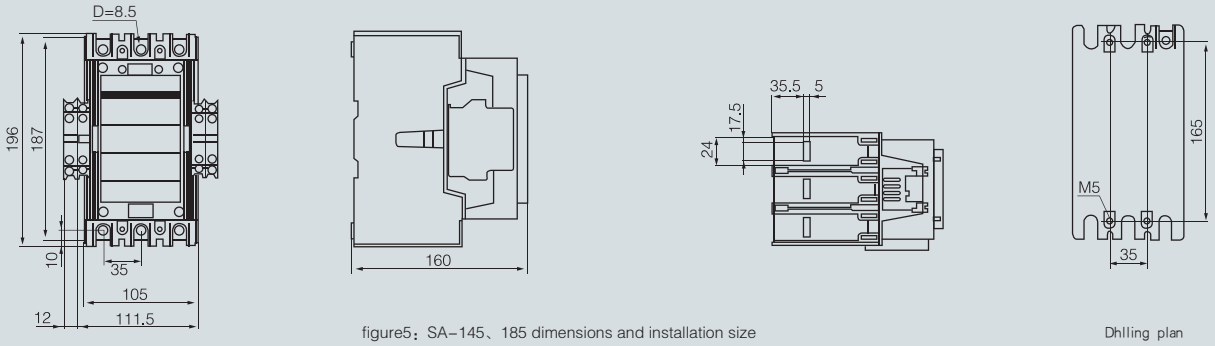


figure5：SA-145、185 dimensions and installation size

Dhlling plan

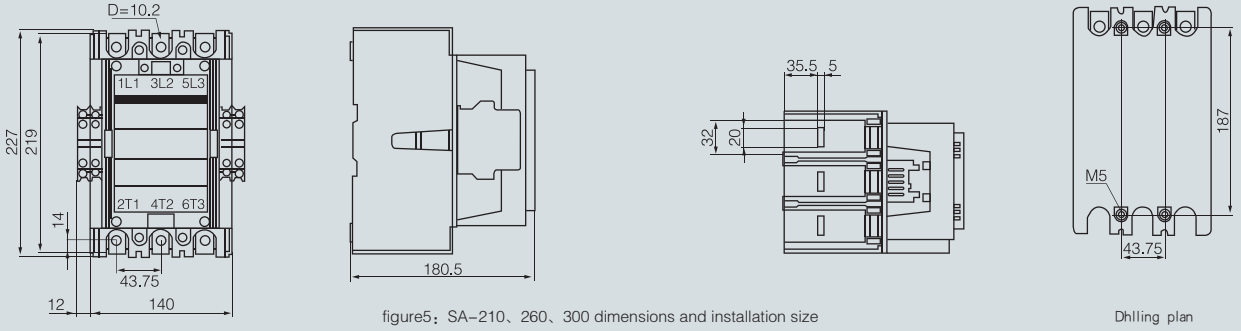
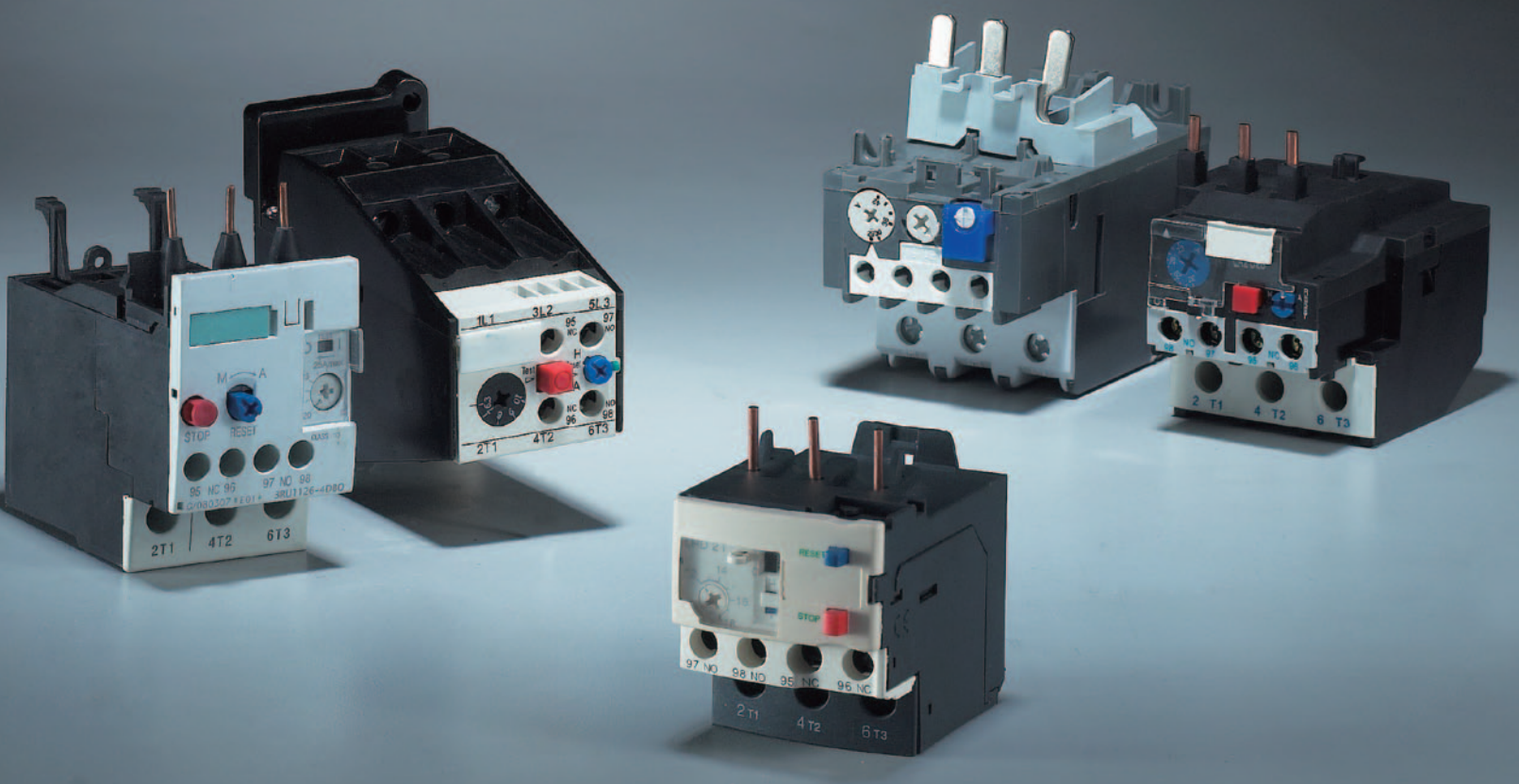


figure5：SA-210、260、300 dimensions and installation size

Dhlling plan

Suntree ELECTRIC
XinChi Electric

Over-Current/Phase-Faiure Protection
Manual/ Automatic Reset
Design of Trip Free
Bimetal Element Type



SLR1 Series thermal overload relay

Application

SLR1 series thermal overload relay are suitable for overload and phase-failure protection of AC motors with frequency of 50/60Hz, voltage up to 690V, current up to 0.1-80A under 8-hours duty or uninterrupted duty.

Functions provided by these relays, are phase-failure protection, ON/OFF indication, temperature compensation, and manual/automatic reset.

Applicable Standards：National Standard：GB14048. International Standards：IEC609474-1 The relays can be mounted onto contactors or installed as single units.

Technical data

Item			SLR1-09~25	SLR1-40~80
Rated operational current			25	80
Rated operational voltage			690	690
Phase-failure protection			Yes	Yes
Manual/Auto reset			Manual	Manual
Temperature compensation			Yes	Yes
Releasing indicator			Yes	Yes
Test button			No	No
Stop button			Yes	Yes
Mounting			Plug-in,as single unit	Plug-in,as single unit
Auxiliary			1NO+1NC	1NO+1NC
AC-15 220V rated current A			1.64	1.64
AC-15 380V rated current A			0.95	0.95
DC-13 380V rated current A			0.2	0.2
Conductor cross section(mm^2)	Main circuit	Solid or stranded conductor	1~4	4~25
		Terminal screw	M4	M8
	Auxiliary circuit	Solid or stranded conductor	0.5~2.5	0.5~2.5
		Terminal screw	M3.5	M3.5

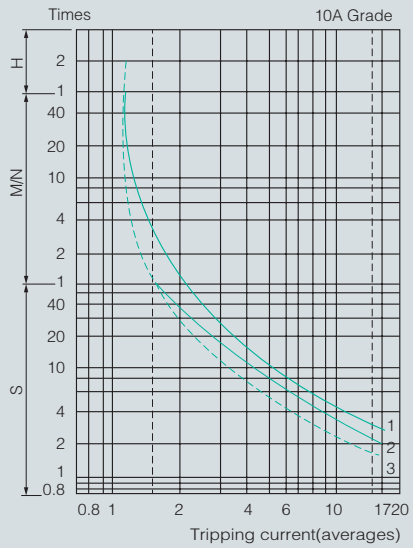
Protection characteristics

Item	NO.	Times the setting current		Release time	Test condition
Overload protection	1	1.05		>2h	Start from Cold status
	2	1.2		<2h	Start from Hot status right after item no.1
	3	1.5		<2m	Start from Hot status right after item no.1
	4	7.2		2s<Tp ≤ 10s	Start from Cold status
Phase-failure protection	5	Any two phases	Another phase	>2h	Start from Cold status
		1.0	0.9		
	6	1.15	0	>2h	Start from Hot status right after item no.5

Selection and ordering dte

Number	Rated current A	Fuse links A		For contactor
		"1"	"2"	
D09301	0.1-0.16	0.25	2	SLC1-09 SLC1-12 SLC1-18 SLC1-32
D09302	0.16-0.25	0.5	2	
D09303	0.25-0.4	1	2	
D09304	0.40-0.63	1	2	
D09305	0.63-1	2	4	
D09306	1-1.6	2	4	
D09307	1.6-2.5	4	6	
D09308	2.5-4	6	10	
D09310	4-6	8	16	
D09312	5.5-8	12	20	
D09314	7-10	12	20	
D12316	10-13	16	25	
D16321	13-18	20	35	
D25322	18-25	25	50	
D40353	23-32	40	63	SLC1-40 SLC1-50 SLC1-65
D40355	30-40	40	100	
D63357	38-50	63	100	
D63359	48-57	63	125	
D63361	57-66	80	125	
D80363	63-80	80	160	

The time-current curves characteristic



SLR2 Series thermal overload relay

Application

SLR2 series thermal overload relay are suitable for overload and phase-failure protection of AC motors with frequency of 50/60Hz, voltage up to 690V, current up to 0.1-150A under 8-hours duty or uninterrupted duty.

Functions provided by these relays, are phase-failure protection, temperature compensation, ON/OFF indication, Stop button ,Test button and manual/automatic reset.

Applicable Standards：National Standard：GB14048. International Standards：IEC609474-1 The relays can be mounted onto contactors or installed as single units.

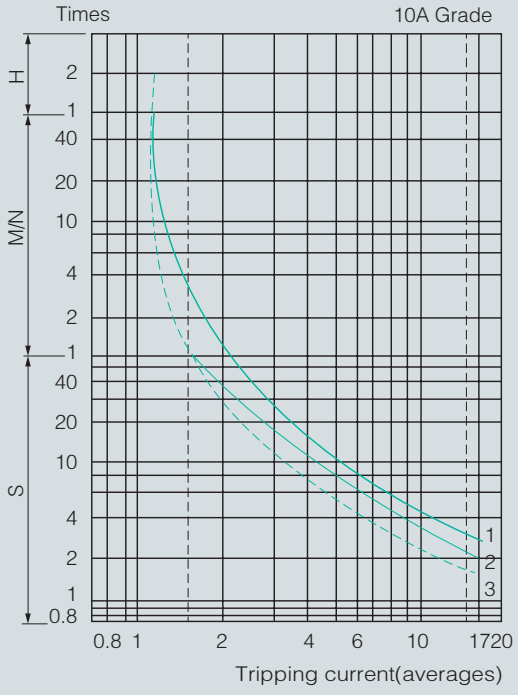
Technical data

Item			SLR2-D13	SLR2-D23	SLR2-D33	SLR2-D43	SLR2-D53
Rated operational current			25	40	93	150	630
Rated operational voltage			690	690	690	690	690
Phase-failure protection			Yes	Yes	Yes	Yes	Yes
Manual/Auto reset			Yes	Yes	Yes	Yes	Yes
Temperature compensation			Yes	Yes	Yes	Yes	Yes
Releasing indicator			Yes	Yes	Yes	Yes	Yes
Test button			Yes	Yes	Yes	Yes	Yes
Stop button			Yes	Yes	Yes	Yes	Yes
Mounting			Pulg-in	Pulg-in	Pulg-in	Pulg-in	Pulg-in
Auxiliary			1NO+1NC	1NO+1NC	1NO+1NC	1NO+1NC	1NO+1NC
AC-15 220V rated current A			2.73	2.73	2.73	2.73	2.73
AC-15 380V rated current A			1.58	1.58	1.58	1.58	1.58
DC-13 380V rated current A			0.2	0.2	0.2	0.2	0.2
Conductor cross section(mm^2)	Main circuit	Solid or standedconductor	1~4	4~10	4~35	4~35	70-2×40
		Teminal screw	M4	M4	M10	M10	M10
	Auxiliary circuit	Solid or standedconductor	0.5~2.5	0.5~2.5	0.5~2.5	0.5~2.5	0.5~2.5
		Teminal screw	M3.5	M3.5	M3.5	M3.5	M3.5

Protection characteristics

Item	NO.	Times the setting current		Release time	Test condition
Overload protection	1	1.05		>2h	Start from Cold status
	2	1.2		<2h	Start from Hot status right after item no.1
	3	1.5		<2m	Start from Hot status right after item no.1
	4	7.2		2s<Tp ≤ 10s	Start from Cold status
Phase-failure protection	5	Any two phases	Another phase	>2h	Start from Cold status
		1.0	0.9		
	6	1.15	0	<2h	Start from Hot status right after item no.5

The time-current curves characteristic



SLRD Series thermal overload relay

Application

SLRD series thermal overload relay is suitable for using in the circuit rated voltage up to 660V, rated current 38A AC 50/60Hz, for over-current protection of AC motor. The relay has the differential product conforms to IEC60947-4-1 standard.

Operating conditions

- The altitude couldn't exceed 2000m;
- Ambient temperature：-5℃～+55℃ and the average temperature no more than +35℃ in 24 hours;
- Atmosphere：Comparative humidity no more than 50% at max +40℃, and it may be higher at a lower temperature. The lowest average temperature no more than+20℃ in the wettest month. The maximum average comparative humidity of this month couldn't exceed 90%, The change of temperature leading to dew on the product must be considered;
- Class of pollution：Class 3;
- The slope between installation surface and vertical surface couldn't exceed ±5° ;
- Keeping away from explosive, corrosive and electric atomy;
- Keeping dry;
- The product should be used and installed at certain place without any shock, vibration etc.

Features

- Three-phase thermal relays with release class 10A;
- With differential phase-failure protection;
- With continuous current adjusting scale;
- With temperature compensation;
- With ON/OFF indicator;
- With TEST (OFF) button;
- With stop button;
- With Manual/Auto reset button;
- With Auxiliary contacts 1NO+1NC insulated each other;
- Mounting：plug in connection with contactor or install as a single unit.

Technical data

Item			SLRD-ND(LRD)	SLRD-NK(LRK)
Rated operational current			38	12
Rated operational voltage			690	690
Phase-failure protection			Yes	Yes
Manual/Auto reset			Yes	Yes
Temperature compensation			Yes	Yes
Releasing indicator			Yes	Yes
Test button			Yes	Yes
Stop button			Yes	Yes
Mounting			Plug-in	Plug-in
Auxiliary			1NO+1NC	1NO+1NC
AC-15 220V rated current A			2.73	2.73
AC-15 380V rated current A			1.58	1.58
DC-13 380V rated current A			0.2	0.2
Conductor cross section(mm^2)	Main circuit	Solid or stranded conductor	1~4	1~4
		Terminal screw	M4	M4
	Auxiliary circuit	Solid or stranded conductor	0.5~2.5	0.5~2.5
		Terminal screw	M3.5	M3.5

Protection characteristics

Item	NO.	Times the setting current		Motion time	Start condition	Ambient temperature
Three-phase balance motion time	1	1.05		>2h	Cold state	20 ± 5℃
	2	1.2		<2h	Heat state	20 ± 5℃
	3	1.5		<4min	Cold state	20 ± 5℃
	4	7.2		2s<Tp ≤ 10s	Cold state	20 ± 5℃
				4s<Tp ≤ 10s	Cold state	20 ± 5℃
Phase-failure motion characteristic	5	Any two phases	Another phase	>2h	Cold state	20 ± 5℃
		1.0	0.9			
	6	1.15	0	<2h	Heat state	20 ± 5℃

Selection and ordering dte

Number	Rated current A	For contactor
D01	0.1~0.16	SLC1-DN09~38
D02	0.16~0.25	
D03	0.25~0.4	
D04	0.4~0.63	
D05	0.63~1	
D06	1~1.6	
D07	1.6~2.5	
D08	2.5~4	
D10	4~6	
D12	5.5~8	
D14	7~10	
D16	9~13	
D21	12~18	
D22	16~24	
D23	30~38	
K0301	0.1~0.16	SLC1-K06 SLC1-K09 SLC1-K12
K0302	0.16~0.25	
K0303	0.25~0.3	
K0304	0.3~0.54	
K0305	0.54~0.8	
K0306	0.8~1.2	
K0307	1.2~1.8	
K0308	1.8~2.6	
K0310	2.6~3.7	
K0312	3.7~5.5	
K0314	5.5~8	
K0316	8~11.5	
K0321	10~14	
K0322	12~16	

S3UA Series thermal overload relay

Application

S3UA series thermal overload relay are suitable for overload and phase-failure protection of AC motors with frequency of 50/60Hz, voltage up to 690V, current up to 0.1-630A under 8-hours duty or uninterrupted duty.
Functions provided by these relays, are phase-failure protection, temperature compensation, ON/OFF indication, and manual/automatic reset.
Applicable Standards：National Standard：GB14048. International Standards：IEC609474-1 The relays can be mounted onto contactors or installed as single units.

Technical data

Item			S3UA-12.5/Z	S3UA-25/Z	S3UA-32/Z
Rated operational current			14.5	25	36
Rated operational voltage			690	690	690
Phase-failure protection			Yes	Yes	Yes
Manual/Auto reset			Yes	Yes	Yes
Temperature compensation			Yes	Yes	Yes
Releasing indicator			Yes	Yes	Yes
Test button			Yes	Yes	Yes
Mounting			Plug-in	Plug-in	Plug-in
Auxiliary			1NO+1NC	1NO+1NC	1NO+1NC
AC-15 220V rated current A			1.15	1.15	1.15
AC-15 380V rated current A			1.1	1.1	1.1
DC-13 380V rated current A			0.2	0.2	0.2
Conductor cross section(mm^2)	Main circuit	Solid or stranded conductor	2.5~6	2.5~6	1.5~25
		Finely stranded conductor with end sleeve	1.5~4	1.5~4	1~16
	Auxiliary circuit	Terminal screw	M4	M4	M5
		Solid or stranded conductor	2×(0.5~1)	2×(0.5~1)	2×(0.5~1)
		Finely stranded conductor with end sleeve	2×(0.5~1)	2×(0.5~1)	2×(0.5~1)
		Terminal screw	M3.5	M3.5	M3.5

Protection characteristics

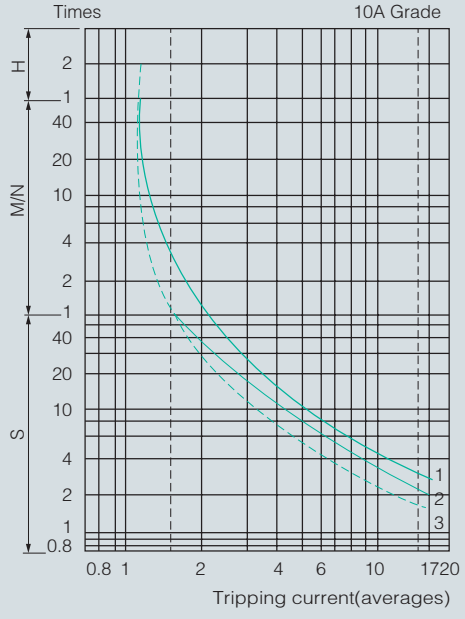
Item	NO.	Times the setting current		Release time	Test condition
Overload protection	1	1.05		>2h	Start from Cold status
	2	1.2		<2h	Start from Hot status right after item no.1
	3	1.5		<2m	Start from Hot status right after item no.1
	4	7.2		2s<Tp ≤ 10s	Start from Cold status
Phase-failure protection	5	Any two phases	Another phase	>2h	Start from Cold status
		1.0	0.9		
	6	1.15	0	<2h	Start from Hot status right after item no.5

S3UA-45/Z	S3UA-63/F	S3UA-80/Z	S3UA-135/F	S3UA-150/F	S3UA-180/F	S3UA-400
45	63	88	135	150	180	630
690	690	1000	1000	1000	1000	1000
Yes	Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes	Yes
Plug-in	as single unit	Plug-in	as single unit	as single unit	as single unit	as single unit
1NO+1NC	1NO+1NC	1NO+1NC	1NO+1NC	1NO+1NC	1NO+1NC	1NO+1NC
1.15	1.15	1.15	1.15	1.15	1.15	1.15
1.1	1.1	1.1	1.1	1.1	1.1	1.1
0.2	0.2	0.2	0.2	0.2	0.2	0.2
1.5~25	1.5~25	2.5~35	25~70	50~120	50~120	≤ 200A 185;>200A 240
1~16	1~16	1.5~2.5	25~50	25~95,Flat bars 20×3	25~95,Flat bars 20×3	Flat bars 20×3/2×30×5
M5	M5	M5	M6	M8	M8	M8/M10
2×(0.5~1)	2×(0.5~1)	2×(0.5~1)	2×(0.5~1)	2×(0.5~1)	2×(0.5~1)	2×(0.5~1)
2×(0.5~1)	2×(0.5~1)	2×(0.5~1)	2×(0.5~1)	2×(0.5~1)	2×(0.5~1)	2×(0.5~1)
M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5

Specifications

Type	Rated operating current(A)	Rated insulationg voltage	Current Setting range
S3UA-50	12.5	660	0.1-0.1,0.16-0.25,0.25-0.4,0.32-0.63,0.63-0.1,0.8-1.25,1-1.6 1.25-2,1.6-2.5,2-3.2,2.5-4,3.2-5,4-6.3,5-8,6.3-10,8-12.5
S3UA-52	25	660	0.1-0.1,0.16-0.25,0.25-0.4,0.32-0.63,1.63-1,0.8-1.25,1-1.6 1.25-2,1.6-2.5,2-3.2,2.5-4,3.2-5,4-6.3,5-8,6.3-10,8-12.5 10-16,12.5-20,16-25
S3UA-54	32	660	4-6,6.3-10,10-16,12.5-20,16-25,20-32
S3UA-58	80	660	16-25,20-32,25-40,32-50,40-57,50-63,57-70,63-80
S3UA-59	63	660	0.1-0.16,0.16-0.25,0.25-0.4,0.4-0.63,1.63-1,0.8-1.25,1-1.6,1.25-2 1.6-2.5,2-3.2,2.5-4,3.2-5,4-6.3,5-8,6.3-10,8-12.5,10-16,12.5-20 16-25,20-32,25-40,32-45,40-57,50-63
S3UA-62	180	660	55-80,63,90,80-110,90-120,110-135,120-150,135-160,150-180
S3UA-66	400	1000	80-125,125-200,200-320,250-400
S3UA-68	630	1000	320,-500,400-630

The time-current curves characteristic



S3RU Series thermal overload relay

Application

S3RU series thermal overload relay are suitable for overload and phase-failure protection of AC motors with frequency of 50/60Hz, voltage up to 690V, current up to 0.1-100A under 8-hours duty or uninterrupted duty.

Several functions provided by these relays, are phase-failure protection, temperature compensation, ON/OFF indication, Stop button ,Test button and manual/automatic reset.

Applicable Standards：National Standard：GB14048. International Standards：IEC609474-1 The relays can be mounted onto contactors or installed as single units.

Operating conditions

- The altitude couldn't exceed 2000m;
- Ambient temperature：-5℃～+55℃ and the average temperature no more than +35℃ in 24 hours;
- Atmosphere：Comparative humidity no more than 50% at max +40℃ , and it may be higher at a lower temperature. The lowest average temperature no more than+20℃ in the wettest month. The maximum average comparative humidity of this month couldn't exceed 90%, The change of temperature leading to dew on the product must be considered;
- Class of pollution：Class 3;
- The slope between installation surface and vertical surface couldn't exceed ±5°;
- Keeping away from explosive, corrosive and electric atomy;
- Keeping dry;
- The product should be used and installed at certain place without any shock, vibration etc.

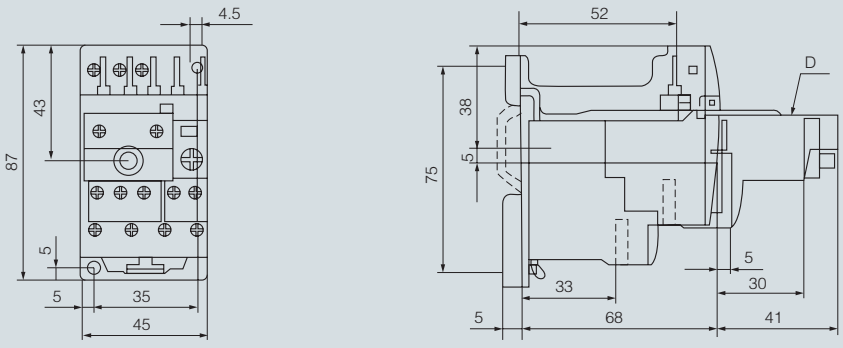
Features

- Three-phase thermal relays with release class 10A;
- With differential phase-failure protection;
- With continuous current adjusting scale;
- With temperature compensation;
- With ON/OFF indicator;
- With TEST (OFF) button;
- With Manual/Auto reset button;
- With Auxiliary contacts 1NO+1NC insulated each other;
- Mounting：plug in connection with contactor or install as a single unit.

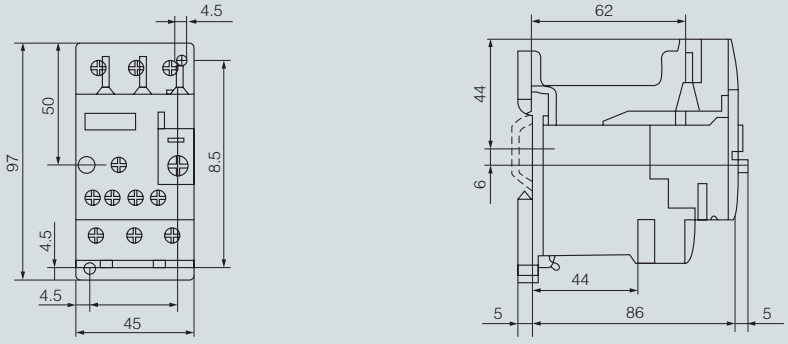
Protection characteristics

Item	NO.	Times the setting current		Release time	Test condition
Overload protection	1	1.05		>2h	Start from Cold status
	2	1.2		<2h	Start from Hot status right after item no.1
	3	1.5		<2m	Start from Hot status right after item no.1
	4	7.2		2s<Tp ≤ 10s	Start from Cold status
Phase-failure protection	5	Any two phases	Another phase	>2h	Start from Cold status
		1.0	0.9		
	6	1.15	0	<2h	Start from Hot status right after item no.5

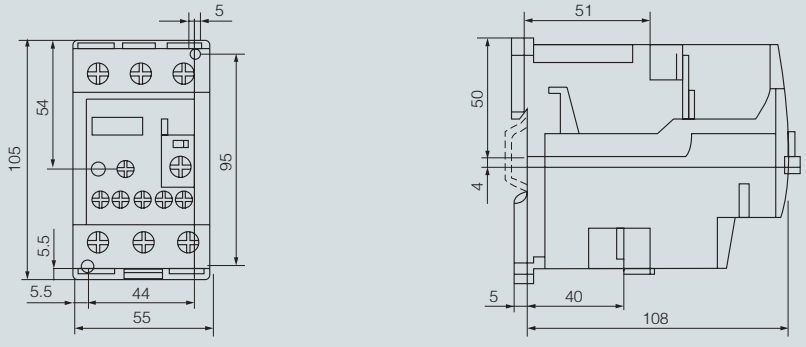
Dimensions



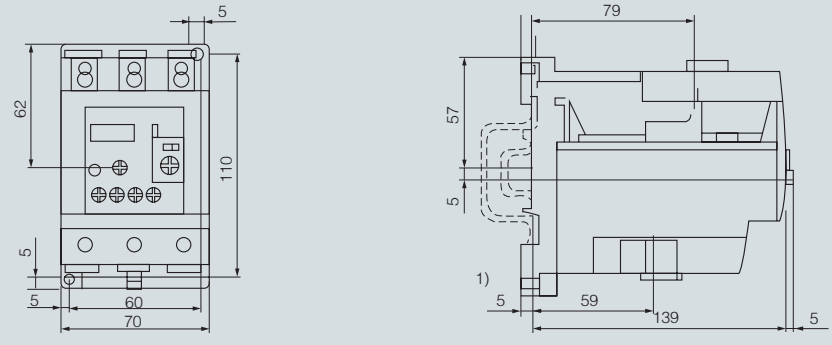
S3RU-12



S3RU-25



S3RU-25



S3RU-100

SGTH Series thermal overload relay

Application

SGTH series thermal overload relay are suitable for overload and phase-failure protection of AC motors with frequency of 50/60Hz, voltage up to 690V, current up to 0.1-85A under 8-hours duty or uninterrupted duty.

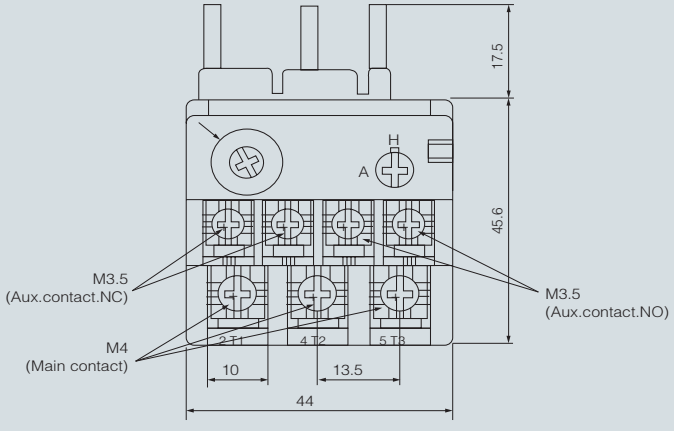
Functions provided by these relays, are phase-failure protection, temperature compensation, ON/OFF indication, Stop button ,Test button and manual/automatic reset.

Applicable Standards：National Standard：GB14048. International Standards：IEC609474-1 The relays can be mounted onto contactors or installed as single units.

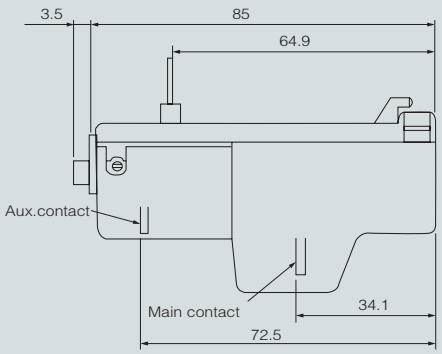
Protection characteristics

Item	NO.	Times the setting current		Motion time			Start condition	Ambient temperature
Three-phase balance motion time	1	1.05		>2h			Cold state	20 ± 5℃
	2	1.2		<2h			Heat state	20 ± 5℃
	3	1.5		<4min			Cold state	20 ± 5℃
	4	7.2		10A	2s<Tp ≤ 10s	63A	Cold state	20 ± 5℃
				10A	4s<Tp ≤ 10s	63A	Cold state	20 ± 5℃
Phase-failure motion characteristic	5	Any two phases 1.0	Another phase 0.9	>2h			Cold state	20 ± 5℃
	6	1.15	0	<2h			Heat state	20 ± 5℃

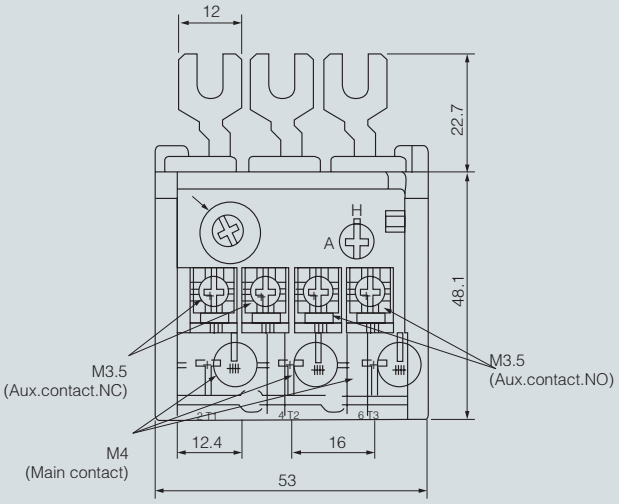
Dimensions

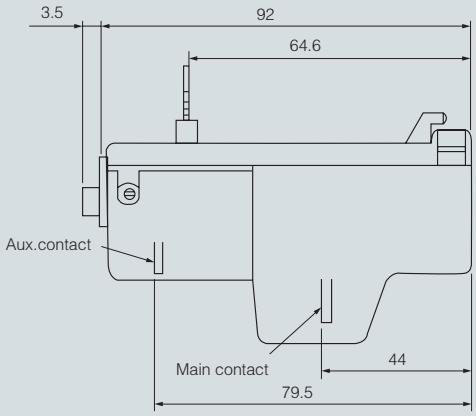


SGTH-22

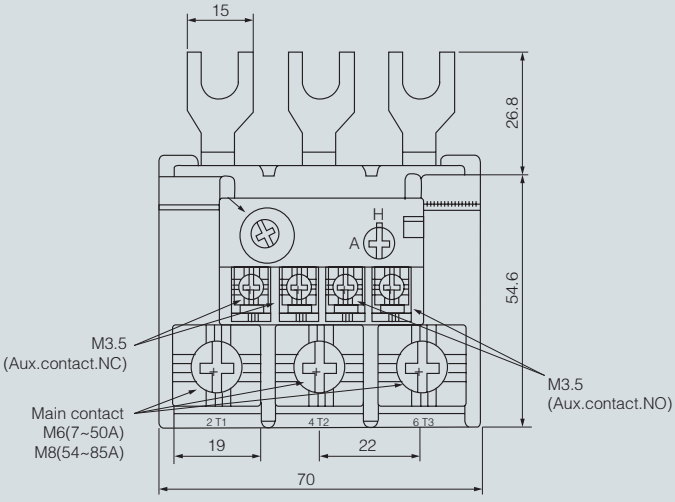


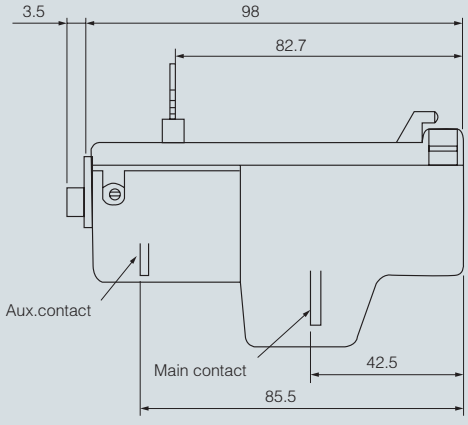
Dimensions





SGTH-40





SGTH-85

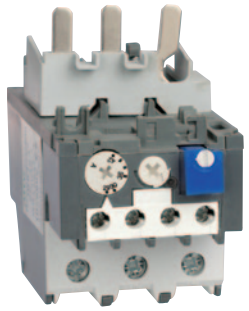
STA Series thermal overload relay

Application

STA series thermal overload relay are suitable for overload and phase-failure protection of AC motors with frequency of 50/60Hz, voltage up to 690V, current up to 0.1-30A under 8-hours duty or uninterrupted duty.

Functions provided by these relays, are phase-failure protection, temperature compensation, ON/OFF indication, Stop button ,Test button and manual/automatic reset.

Applicable Standards：National Standard：GB14048. International Standards：IEC609474-1 The relays can be mounted onto contactors or installed as single units.



Protection characteristics

Item	NO.	Times the setting current		Motion time		Start condition	Ambient temperature
Three-phase balance motion time	1	1.05		>2h		Cold state	20 ± 5℃
	2	1.2		<2h		Heat state	20 ± 5℃
	3	1.5		<4min		Cold state	20 ± 5℃
	4	7.2		10A	2s<Tp ≤ 10s ≤ 63A	Cold state	20 ± 5℃
				10A	4s<Tp ≤ 10s>63A	Cold state	20 ± 5℃
Phase-failure motion characteristic	5	Any two phases	Another phase	>2h		Cold state	20 ± 5℃
		1.0	0.9				
	6	1.15	0	<2h		Heat state	20 ± 5℃

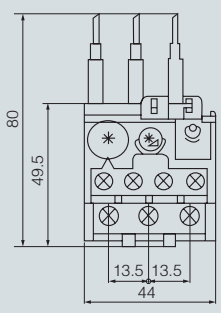
Selection and ordering dte

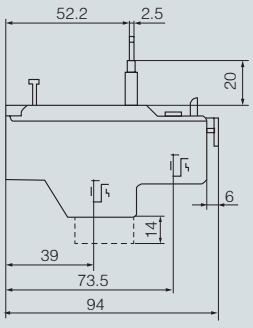
Number	Rated current A	Fuse links A	For contactor
STA-25	0.1~0.16	0.5	A9-A40 AL9-AL40
	0.16~0.25	0.63	
	0.25~0.4	1.25	
	0.4~0.63	2	
	0.63~1	4	
	1~1.4	4	
	1.3~1.8	6	
	1.7~2.4	6	
	2.2~3.1	10	
	2.8~4	10	
	3.5~5	16	
	4.5~6.5	25	
	6~8.5	35	
	7.5~11	35	
	10~14	35	
	13~19	50	
	18~25	63	
	24~32	80	

Selection and ordering DTE

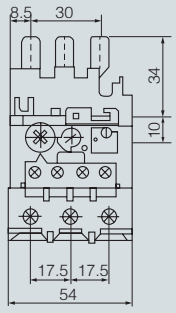
Number	Rated current A	Fuse links A	For contactor
STA-42	18~25	63	A30-A40 AL9-AL40
	22~32	80	
	29~42	80	
STA-75	22~32	80	A50-A75 AE50-AE75
	29~42	80	
	36~52	100	
	45~63	125	
	60~80	160	
STA-110	65~90	200	A90,A110 AF95,AF110
	80~110	200	
STA-200	66~90	200	
	80~110	200	
	100~135	315	
	110~150	315	
	130~175	315	
	150~200	315	

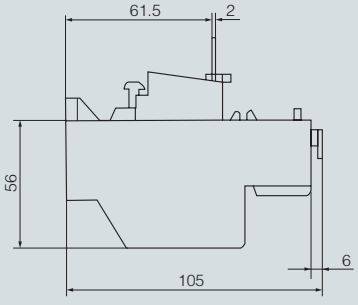
The time-current curves characteristic



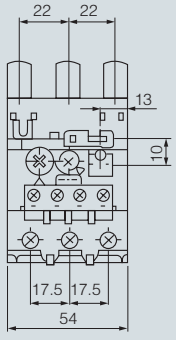


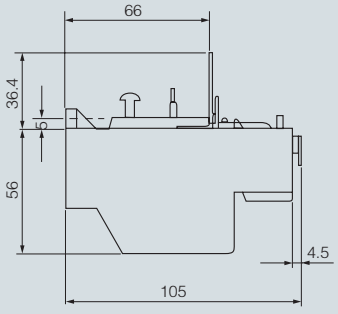
STA-25





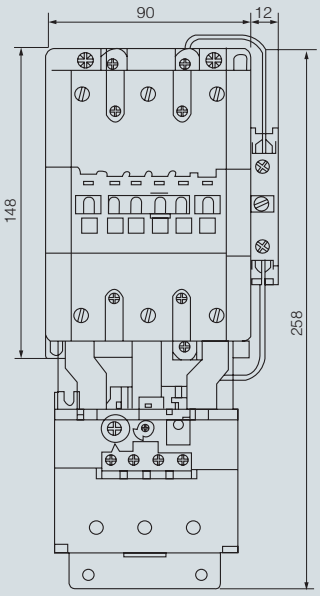
STA-42

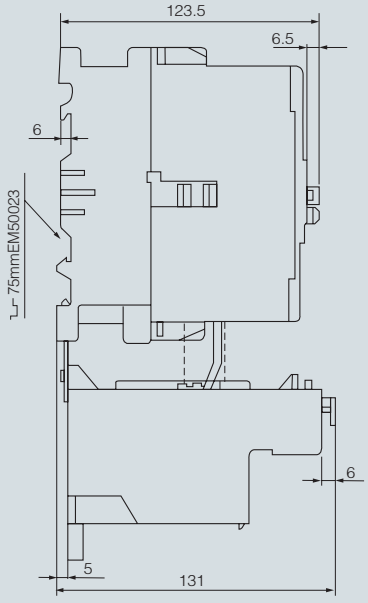


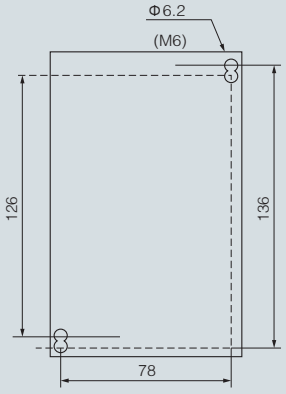


STA-75

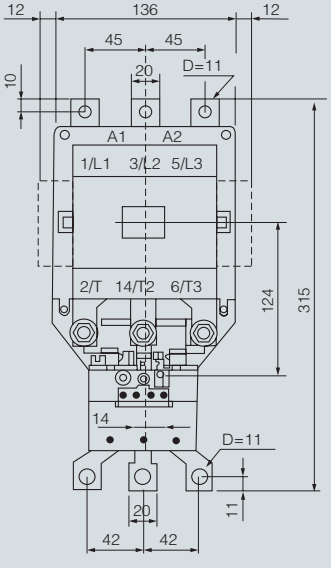
The time-current curves characteristic

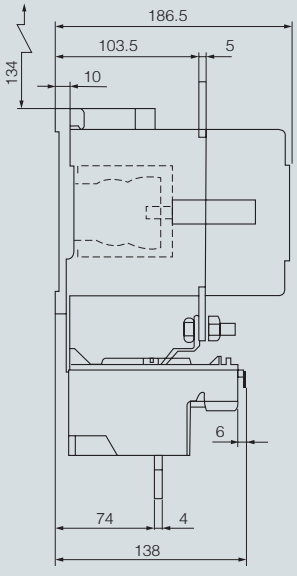


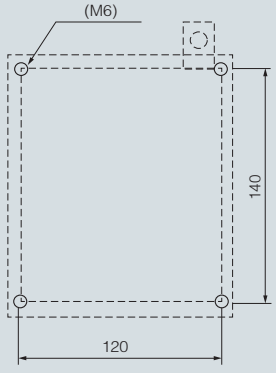




STA-110







STA-200

SLE1-D Series thermal relay

Application

SLE1-D magnetic starter is mainly applied to circuit of AC 50 or 60Hz, voltage up to 550V for far distance making and breaking circuit and frequent start and control motor. It has the features of small volume, light weight, low power consumption, high efficiency, safe and reliable performance etc.

Specification

Maximum power AC3 duty(kW)						Rated current(A)	Type of enclosure	Code number		Suitabie Thermal Relay(A)
220V 230V	220V 230V	415V	440V	500V	660V 690V			LL(long life)	NL(3)(normal life)	
1.1	2.2	22	22	-	-	6	-	-	SLE1 EC135	SLE1 EC135
2.2	4	4	4	5.5	5.5	9	IP42 IP65	SLE1 D0.94… SLE1 D093…	- -	SLR2 D1312 SLR2 D1314
3	5.5	5.5	5.5	7.5	7.5	12	IP42 IP65	SLE1 D124… SLE1 D123…	SLE1 D0.94… SLE1 D093…	SLR2 D1316
4	7.5	9	9	10	10	18	IP42 IP65	SLE1 D188… SLE1 D185…	SLE1 D124… SLE1 D123…	SLR2 D1321
5.5	11	11	11	15	15	25	IP42 IP65	SLE1 D258… SLE1 D255…	SLE1 D188… SLE1 D185…	SLR2 D1322 SLR2 D2353
7.5	15	15	15	18.5	18.5	32	IP55	SLE1 D325…	SLE1 D258… SLE1 D255…	SLR2 D2355
11	18.5	22	22	22	30	40	IP55	SLE1 D405…	SLE1 D325…	SLR2 D3353 SLR2 D3355
15	22	25	30	30	33	50	IP55	SLE1 D505…	SLE1 D405…	SLR2 D3357 SLR2 D3359
18.5	30	37	37	37	37	65	IP55	SLE1 D655…	SLE1 D505…	SLR2 D3361
22	37	45	45	55	45	80	IP55	SLE1 D805…	SLE1 D655…	SLR2 D3363 SLR2 D3365
25	45	45	45	55	45	95	IP55	SLE1 D955…	SLE1 D805…	SLR2 D3365
Enclosure					SLE-D09 and D12			Double insulated protected to IP429(3) or to IP659(4)		
					SLE-D18 and D25			Double insulated protected to IP427(3) or to IP557(4)		
					SLE1-D32…D25			Metal,IP55 to IP559		
Control(2 pushbuttons mounted on enclosure cover)					SLE1-D09…D95			1 green Start button"1" 1red Stop/Reset button"0"		
connections					SLE1-D09…D95			Pre-wired power and control circuit connections		
Standard control circuit volatges										
Volts	24	42	110	220/230	230	240	380/400	400	415	440
50/60Hz	B7	D7	F7	M7	P7	U7	Q7	V7	N7	R7